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Independents Retain Identity

Annual Convention of United States Independent Telephone Association Refuses Proposal to Admit Bell—A. T. and T. Official Addresses Big Meeting

Chicago, Ill.—There are still two sides of the fence in the telephone field.

The resolution to throw open the Independent association to Bell membership, which was adopted at the meeting of the Illinois state association for presentation to the national Independent body, withered under the blaze of opposition, was politely refused succor by the Bell, and finally, deserted by its sponsors, dragged itself ignominiously to oblivion.

But after all, in its brief career, this resolution served a purpose.

It inspired the greatest outburst of Independent enthusiasm and renewal of allegiance to the standard of the body that any telephone convention has witnessed for years. It provoked expressions of confidence in the Independent's future that augurs well for the permanence and prosperity of that faction of the telephone industry.

It drew from the Bell a concrete admission that this organization had its hands full in serving its part of the public, and while having no desire to extend the scope of its problems, was eager to work with the Independents in creating better conditions for the entire industry.

The emphatic treatment given this open door resolution was the outstanding feature of the 1922 United States Independent Telephone Association convention. Almost a thousand company representatives and men from the manufacturing companies were in attendance.

Man Clearing House Proposed.

In his presidential address, President F. B. MacKinnon remarked that the Independents' problems were generally what they had been for the last ten years, the greatest among them being the need for men and money. He called attention "to the fact that our industry—our group of the industry rather—is peculiar in that we are made up of so many different units

F. B. MacKINNON
Re-elected President of Independents

that we have no organization of our men.

"The Bell organization, with its many companies, is able to build its thousands of employes into an organization by which each man feels that ahead of him is a place that is open to him if he makes good. Our half of the industry is made up of 8,000 separate units, as you know—each one of them a corporation or a plant unto itself.

"A man who is in your employ does not look forward to moving on up to a larger exchange operated by you, or to a larger exchange position, or to some general executive position. The average man in the employ of our companies realizes that, if he is to move on, he must move to another company; that the chances are, when he starts working for you, he will remain there until he resigns or until he decides that it no use.

"That, to my mind, is the great problem which we have confronting us today—to build up some sort of a personnel organization so that we may cultivate the ambitions of our men, may hold out to them advance positions, and may advance them in those positions gladly.

"One of the difficulties of our situation is that the average manager is very reluctant, indeed, to go to another plant and ask that plant manager for a valuable man, and we seem to have a sort of code of ethics among us that we will not shift our men around. But it seems to me, and I hope you will agree with me, that if we do not change this, we are not going to get new blood into our organizations; we are not going to get the results that we should have.

"The only cure for it, it seems to me, is some sort of a national personnel organization that will in a measure form a means of promotion of men from one position to another as they prove themselves worthy and capable.

"That, to my mind, should be one of the primary activities of your association during the coming year, to attempt to lay the foundation for some sort of a plan by which the men who enter your employ may do so with their eyes fixed upon a goal of the management of some large and extensive Independent property. Without something to work for and look forward to, we can not hope, as I have said, to enlist in our ranks the sort of talent that we should have.

"This problem of men is, I think, the most serious problem.

"The problem of money comes when we have the men, almost always, and we can solve that problem when we have the men, because money is a commodity which we can buy when we can show that we can use it properly and pay for that use of it; but we can not pay for that use unless we have the men to operate the properties.

"With the men to operate the properties we can get the rate from the public when we give the service; by giving the service we can get the money.

Active in Tax Help.

"During this year, as usual, the two offices of your association have been conducted at Washington and at Chicago. At Washington we have been busier than usual in handling income tax cases for individual member companies.

"No doubt, in all of the states that are represented here complaint is being made that the national organization does nothing for its members. The national organization may not

have done anything specific for you this year, but it was doing something very specific for a good many other companies and the fee that you paid to the national organization might be likened, indeed, to the insurance premium which you pay for your insurance policy. It is available to you; the service is there when you need it.

"The time has come about every two or three years when the organization has had to do something in a general way for every member, but the time is here always when we are performing services for the individual members which affect all of the others on account of the precedents that are established, the authorities, and on account of the work that we do in building up an organization.

"We expect this coming year to take up the question, and we want to bring it to the attention of the convention, of having the tax on toll messages removed. We have heard from members in various parts of the country agitating that.

"Last year the matter was brought to us and was very carefully considered and we advised the members of the finance committee and the Senate, who suggested that it was not an opportune time to suggest that; there were being adjustments made in corporation and income taxes, and in corporation stock taxes, and in their opinion it was not wise to call attention to the removal of any particular tax for which there was no public demand.

"That is one of the peculiar things about this tax on toll messages; there has been no general public demand for its removal although we who are operating the companies realize that it is a burden on business, that it is a deterrent and should be taken off now that the country is in full swing again.

"But when we start presenting this measure to Congress, we shall have to have expressions from your chambers of commerce, from your business men, from all over the country, indicating that the business man, the user of the telephone, the man who is really paying the tax—for all we are doing is collecting it—the man who is paying the tax desires its removal, and to show in a positive way that that tax is a burden on the business of this country. When we do that I am very sure that Congress will be very glad to act, as it did in removing the tax on the railroad freight rates.

Details State Work.

"The national organization can not well go into your detailed rate problems, into your engineering problems, into the other problems which are local; but your state associations should. They should carry all of those things for you. As questions are asked of us, we have endeavored to refer the member companies back to their own state officials in the hope of working out a co-operative scheme that would enable the state association to perform a real service for its members and function as it should.

Traffic Work to Be Resumed.

"We feel the need now in our organization of resuming some of our work in traffic. It has been several years since the national organization issued any toll traffic rules and we are having quite a demand for them. During this coming year I think we should issue another edition of our toll rules after a careful editing, so that all of our companies may have in the hands of their operators Independent traffic rules. These rules have been changed considerably due to conditions during the war and since then, so that the rule book which was issued several years ago is rather obsolete now.

"We find a great need, a growing need and demand, among the chief operators for such a book, and I think this coming year the association should take that up as one of their activities and in that way resume some of the service work which we formerly did, but not to the extent of interfering in any way with those operators' schools which the various state associations in connection with their district meetings have so successfully held, and the holding of which is one of the very basis of their existence and has done so much to build up the state organizations.

Work on Standards.

"During this year the association has been represented on a number of committees of the American Engineering Standards Committee, which, as most of you know, is an organization of the various engineering societies and industries with a large headquarters in New York. Representatives of the association have served on the committee on standardization of crossing rules, where trolleys, electric railways, are crossing telephone and telegraph wires. Representatives of the association have served on the committee on safety code for lightning protection; on the sub-committee for radio protection; on the standardization of wood poles.

"Previous to the organization of this American Engineering Standards Committee, the most of this work was done by the Bureau of Standards at Washington. The Bureau of Standards still participates in all the present conferences.

Union of the States.

"During July we called at St. Paul a meeting of the state association executives, where we had an informal conference with the presidents and secretaries of some dozen different state associations with very great profit, I think, to the whole situation, giving us a different viewpoint than we had of some of the state association activities and giving those men some idea of what was going on in other states and other methods.

Shield National Emblem?

"We have before us now, I should say, as one of our detail problems, in addition to those which I have mentioned, one which has been brought to us from New York state as to the continued use of the Independent Shield in advertising. In New York state a law has been passed, which went into effect this fall, that penalizes the use of the national emblem in any way in connection with advertising. The printing of it is penalized. There is always a question, of course, as to whether we are using the national emblem, but that question has been brought forward.

"During this year we expect to make a detailed study of the situation and at the next convention have some propositions brought forward as to whether or not we should make a change in the use of the emblem which has represented Independent telephony so long.

Radio's Place.

"Another one of our questions, which is coming to us very strongly is in connection with the use of radio. These radio people have various ideas. There has been discussion, there is discussion today, every time you get with a radio fan, as to the future of radio development as applied to the telephone business.

"Wired wireless comes very close to the telephone man. It holds out possibilities by which he can increase his income without increasing his investment; it holds out possibilities for closely co-ordinating radio and wire business. Those of us who have been studying the national situation regard this as one of the questions into which we must dip very deeply, and very soon it must be known throughout the country whether or not the telephone companies are going to be in contact with each other by other means than the straight wire line as we use it today.

Independent's Growth.

"I want to call attention, in closing, to the fact that Independent telephony continues to grow.

"We had, at the close of 1921, 39 A class companies. Some eight years ago we had 18 A class companies. During the period since that there have been changes—some selling out, consolidations and mergers—but notwithstanding that last year there reported to the Interstate Commerce Commission 39 A class companies, independent.

"Eight years ago we had 105 B class companies. Last year there reported to the Interstate Commerce Commission 165 Independent B class companies.

"These two groups represent 1,400,000 telephone stations and an investment of $200,000,000.

"The A class companies alone increased from 1916 to 1921 over 200,000 stations. Growth; constant growth! That means constant money. The rate of growth has been at about the rate of 7 per cent increase in the number of stations each year.

"There are now about 850 C class companies. In 1921 over 130 companies reported as C class companies that reported as D class companies in 1920. The growth has been surprising in that line.

"The tendency is seemingly to increase the size of our larger companies. Our larger companies are growing, some by extension of their present facilities, some by acquisition of neighboring Independent companies.

"I call your attention to these figures not simply for the purpose of giving you a little statistics but also of impressing upon you the vitality of the Independent group, the vitalizing growth of its members and what a place it occupies in Independent telephony and what a place it occupies in the industry as a whole.

Slams Surrender.

"One reason I do this for you is not alone to enable you to pat each other

on the back but because recently there have been suggestions that the Independent group drop out of existence because it no longer has a reason for living. And I want to say to you that there never was a time in the telephone industry when there was more need for the Independent group and there never was a time when we were showing greater strength, intrisic strength, than we are today.

"These companies are on a solid basis and their life is easier; and why at this very time when we are at the very height of our strength and the pinnacle of our efforts, you might say, it should be suggested that the Independent group by some motion or proposal should wipe itself out, I can not understand."

Deering's Report.

Secretary-Treasurer Chas. C. Deering then reports figures for 1921 and the first nine months of 1922, showing the body's financial status.

The total membership of 862 consists of 820 operating and manufacturing companies; nine associate members; five foreign members, and twenty-eight honorary members. The total does not include 100 companies which have not paid their 1921 dues. There are 44 manufacturing companies and 250 operating companies which contribute to the support of the association.

Ethical Code Proposed.

"Real honest-to-goodness practical rules of action" codified for the guidance of Independent telephone men were proposed by John Z. Miller. This proposal met with a favorable reception, and as a result of committee action a code of ethics is to be adopted.

The slaughter of the proposal to admit the Bell to membership then began on the floor with W. H. Bryant of Mobile, Ala., firing the opening broadside. Perry C. Holdoegel of Rockwell City, Ia., regarded the resolution as jeopardizing the Independents' interests and lit on it with both feet. Preisdent MacKinnon and J. M. Plaister denied vehemently any attachment to the proposition, and the President commented on the phase of the proposal which sought to secure representation of state associations having both Independent and Bell members, on the national Independent directorate, as being impractical.

The Illinois resolutions were tabled without reading after their presentation.

A warning that the development of class consciousness was a serious menace to American ideals was given the convention by John G. Maling of Chicago, who cautioned his listeners that they were so deeply engaged in making money that they were not watching and seeing what is going on about them.

For ten years, Mr. Maling asserted, Samuel Gompers, the American Federation of Labor head, had been preaching that there was no community of interest between employer and employee, and labored to nullify the constitution and courts by class legislation. Steamship companies' traffic building efforts which brought hosts of emigrants who would never enter the melting pot, also was cited by Mr. Maling as a danger.

Forcing of the Adamson law through Congress was described by the speaker who presented this as an illustration of the necessity of business men giving more time and thought to legislation.

What was said to be the largest crowd that ever faced a telephone convention speaker listened to the Bell statement of policy made by Vice President E. K. Hall. He qualified as a diplomat of no mean calibre and pronounced the obituary of many Bell-Independent animosities. Mr. Hall's address is printed in full elsewhere in this issue of TELEPHONE ENGINEER.

Wired wireless was explained and its development traced by Major J. O. Mauborgne of the Signal Corps Engineering Department and at one time closely associated with General Squier in wired wireless work. The Major illustrated how telephone and power wires could be used as antennae and made an effort to receive market reports being broadcast from a Chicago station. Not much success was obtained with the loud speaking device but the messages were received plainly in a receiving head set.

Officials Re-elected.

The only change in the official roster of the Independent association was the election of T. L. Youmans, of Osawatomie, Kan., to the directorate, succeeding H. L. Gary of Kansas City, Mo. The officers of the association had a satisfying endorsement of their administration by unanimous re-election.

Sub-station Protection.

Sub-station protection from the underwriters' standpoint was discussed by W. S. Boyd, secretary of the Western Association of Electrical Inspectors, and from the telephone company's standpoint by R. V. Achatz of Purdue University, Technical Editor of TELEPHONE ENGINEER, the remarks of both speakers being presented in detail in this issue of TELEPHONE ENGINEER.

A lively discussion followed the reading of the papers on Sub-station protection.

The committee on resolutions presented recommendations for early action on a code of ethics, on the publication of a new and modern book on operating practice for general distribution and sale to all companies. Thanks were extended to the manufacturers for their efforts in making the convention a success.

In the general discussion which featured the closing session of the convention a suggestion was advanced by H. E. Bradley that the Independent association advertise its activities more. A cry for increased share of toll revenue also was raised and proved to be a live point with many. A sketchy outline of the Illinois association's proposed advertising campaign was presented by Jay Mitchell. Mr. Mitchell also called attention to the necessity of avoiding a conflict in state convention dates and solicited help in getting public utility courses in the University of Illinois.

DIRECTORS MEET

Officers Re-Elected—A. F. Adams Resigns—Knock Out Bell Admission Proposal

Chicago, Ill. — Opposition of the strongest kind to the admission of the Bell to the Independent association was expressed at the annual meeting of the directors of the Independent association.

In view of the peace and progress now manifest in the Independent branch of the industry, the directors deemed it unwise to entertain any association alliance, and rejected the idea in any form. Some mention was made of a suspicion that the Bell did not desire any such move.

As the Independent chief for the coming year F. B. MacKinnon was unanimously re-elected president and carried his executive family along on his ticket with the exception of A. L. Adams whose duties as chairman of the board of directors of the Commerce Trust Co., of Kansas City necessitated his retirement after valuable services to the association. Charles C. Deering was re-elected as secretary-treasurer, and Frank Beam, J. B. Earle, and W. S. Vivian were named as vice-presidents. C. A. Shock was elected to the vacancy in the directorate caused by Mr. Adams' resignation.

Consideration was given to adjustments under the Hall memorandum and to other deals whereby Bell and Independent interests acquired properties.

The suggestion was made that as many telephone men as possible attend the convention of state railway and utilities commissioners to be held in Detroit in November as the program was to be one of great interest to the telephone industry, and the speakers included President MacKinnon and President Thayer of the Bell.

"Bury the Axe" Hall Proposes

Vice President of Bell in Independent Convention Address Says Progress and Protection Lie in Friendly Continuance of Phone Industry's Present Alignment

By E. K. Hall

Vice President American Telephone and Telegraph Co.

I appreciate more than I can tell you the invitation to come and talk things over with you men in this convention. I am a great believer in getting together and talking things out.

It happens that, in historical development of the telephone business in this country, it has just sort of worked out that there are two very distinct groups—the companies constituting the Bell group and the companies constituting the Independent group—and both of these groups welded in a group for their common interests in the industry.

Of the two questions that I would like to raise and answer so that you will know where we stand, the first is: Is it desirable to have two groups? It never was designed. It sort of grew so—that is the way it happened. In the industry today there are two large powerful groups. Is that desirable?

Second: If it is desirable, and if it is going to continue to exist, what ought the relationship to be between those two groups?

All I can expect to tell you today is our opinion on these two questions and give you the reasons for our opinion, and then you will know how we feel about it.

Two Groups the Best.

Answering the first question, I say without any question or equivocation or hesitation that, in our judgment, it is in the interests of the two groups, it is in the interests of the industry and in the interests of the public that there should continue to be two strong powerful groups in the industry.

As to the relationship between those two groups, I have no hesitation in saying that it is our feeling that it is in the interests of the industry, in the interests of the two groups, and in the public interest, that those two groups should work together in cordial constructive co-operation.

Now I want very briefly to give you my reasons for our belief in that connection.

We feel that it is fortunate that there are groups; it would be unfortunate for the industry if there were a monopoly in this industry, as it would be unfortunate for any industry, I don't care what it is, to have a monopoly in it, all under the control of one group of people or one management. There are few industries that could survive the reactions from such a situation. It would not be in the public interest.

On the other hand, if the ownership and control is divided and scattered, the public will understand the industry better, understand the people in the industry better, come to know the industry and its problems better; and the public will treat the industry and the people in it better, and that I take it is the biggest problem that we in the industry have got to be sure that we get good, fair public treatment for the industry; and to the extent that our interests are identical, it is desirable that the two groups should co-operate.

Peril in Further Division.

Now I have said that I thought it was fortunate that there were two groups. I mean just exactly that. I think that it is fortunate that there are two groups and not 50. We have seen what happened to the great transportation industry in its development of 60 years, when they had 10, 20, 30, 40 or 50 groups. It was too widely scattered to get any real cohesive co-operation in the defense and protection of the industry.

So I say again that we feel it is fortunate that there are two groups or a small number of groups like two.

Now as to the relations between those two groups: We say that we feel that there should be, that it is desirable that there should be, cordial co-operative relationship between the two groups.

Why? I would like to turn that question around. Why not? We are all in the same industry, and if our interests are essentially identical, why can there be any question of the desirability of our co-operating to protect those mutual interests?

One difficulty, perhaps, is that we have assumed in the past—and maybe at times in the past we have assumed it rightly—that to quite an extent our interests were not identical, that they were opposed, and also there was a lot of misunderstanding between the two groups. Of course, you cannot have anything like good relations between people or groups of people unless they understand each other and more or less believe in each other.

Mutual Respect Vital.

It would have been impossible for me to get together and work out some things that I have done with your president if I thought he was a horse thief. I don't. I have a whole lot of respect for him; I respect his motives; I believe in what he says. Now if I didn't, if I thought he was trying to put something over on me every single minute, I would spend my time not trying to co-operate but with my fists up to see he didn't get through anywhere.

It is just the same with groups of people. Unless there is some understanding, some sympathetic understanding of the motives on each side, an entire lack of unfounded suspicion and distrust, there is never going to be very much real co-operation.

In the past conditions have been at different times, speaking very frankly, very often wrong for the possibility of any co-operation. Conditions have been such as to rather engender suspicion by one group of the other, distrust by one of the other, hostility by one group of the other or members of one group as to members of the other group.

I am just going to ask if it would be worth while to take a few minutes just to look things over a little and see if those things, whatever they have been in the past, have not very materially if not wholly changed.

To do that we would have to go back and see why it was that you were suspicious of us. I guess if I asked you that question we would have a long session here, so I am going to undertake to answer it; also I am going to tell you why we were suspicious of you. You know; we know, but I am just refreshing your recollections a little so we will get somewhere as a start.

How the Fight Started.

In the first place, there was a time when we thought we were about the only people doing telephone business. Then along came some of you. I don't mean anybody in this room, but then some of your friends came along and came to places where we were doing a telephone business and said: "We want to come in and do the telephone business in this town also."

We said: "What do you mean, come in and do it also? We are the telephone people of this town. We got here first."

"Yes," you said, "but you are doing a rotten job."

That made us sore. The fact that we were doing a rotten job, and that you were entirely right about it in a good many cases, didn't make us any less sore.

You said that you wanted to come in in the interests of the public. You understand when I say this I am not talking about anybody in this room; I am talking about some of your predecessors; and when I talk about myself, I am talking about some of my predecessors. So we can say what we please about them. They are not here.

You also said to us, that is somesomebody did—in cases you did once in a while—that what you really wanted to do was to take care of the public; that we were charging them too much money; our rates were too high, and

you were coming in there to kind of take care of the public.

Now we had a kind of an idea that you were not 100 per cent frank about that. You were perfectly willing to take care of the public, but on the side you wanted to make about as much money as we did out of the business.

Well, that bothered us a little bit. You said that our rates were too high. That bothered us a whole lot because we didn't think they were. And talking here among telephone men, I will say right now I don't think there is likely to be any such thing as telephone rates that are too high.

Parson Gives 'Em "the Bird"

I know just how this worked because it was worked on me. I was connected then with the New England Telephone & Telegraph Co., and there a man came. I don't know where he came from; I think he came from Ohio. He came into Boston. The name was Zephaniah Holbrook. I think he was in the ministry, and he left that and went into the telephone business. He came into Boston and the minute he struck town—he had a good press agent—he told the public and everybody else that he had come there to relieve them from our clutches. I was not clutching anybody that I knew of until then.

He started in. I don't know where he got his dope but before he had been there a week, he began to say things about us. It made us very very sore. We didn't suppose anybody else knew it but us—and half the stuff he told us about ourselves, we didn't know was true until he told us and we came to look it over. It bothered us because he came from out of town. It would have been better if someone right in Boston had said: "Here, this New England telephone company is a pretty bum bunch. They haven't done things well. Give us a chance and we will show you how to run things right."

That would not have bothered us so much, but to have a fellow that we had never heard of come in and tell us all about it and hearing him make remarks— some of which we knew were wrong but some of which we were obliged to confess were right—made us sore. And the thing that especially bothered us was that he was not a telephone man. He had only been in the telephone business about a year, as near as I could find out.

Backfire to Getting Sore

He may have made a good many Christians before he went out of the ministry but he made no Christians in the New England telephone company. He just made us sore, and it was quite a while before we got onto the game that was one of his first schemes—to make us sore. While he kept making us sore, we tried not to show it so much afterwards. He called himself an Independent telephone man, and we got so sore at that man that for years, several years, I never could feel that there was any Independent telephone man who would state the case quite as well as we would state it if we had a chance. He was not the best of representatives.

It is very easy to see, under those conditions, how we felt, the Bell people felt, sort of wronged and felt suspicious, a little distrustful and a little sore. That was the most natural thing in the world.

There grew up a period of duplication in the telephone business pretty much throughout the country, and it was quite a while before we realized —I say we, I mean all of us, I think— quite a while before we realized that competition in the telephone business was a different thing from competition between two merchants. Two merchants compete for a share of the business and compete for enough of the business to make some profit.

We realized, as time went on we began to realize, that in the telephone business it was different, where each one had to build a plant and stay by it; and that it was not a question of competing for profits very often—it was a question of competing to protect the principal, protect the stake and everything that was in the business.

Bitterness of Fight for Life.

In the old days of bitter competition in many ways it literally became a fight to protect the principal and capital invested in the business. That simply stored up a bitterness unknown almost to any ordinary commercial competition. It seemed like the situation in many cases was an absolutely impossible one, and it was quite difficult in the early days to see the answer, for anybody to see the answer.

It was very easy—the easiest thing in the world—for each side to offend the other, and offend the other seriously and misunderstand the other. Conditions were ideal for misunderstanding, suspicion and distrust. There was no such thing as co-operation; there could not be. There was no such thing as identical interests; there could not be.

Yet the public and the companies for a while accepted this situation as more or less inevitable in the development of the telephone industry as an industry; but gradually the public began to change their minds, to come to the conclusion that they were not getting a complete service, complete local service. They began to wonder whether this duplication of plants was really in their interest or not.

Economic Question Arises.

They began to think there was something which they could not quite state but which they could feel, namely, that there was something economically unsound in duplicating telephone plants or any other kind of public utilities. They began to think that it was not the way to get fair rates or low rates, because even though they got low rates, they got a more or less divided service.

Therefore, gradually they began to come to the conclusion that it was through regulation that they ought to be protected against what they feared, namely, exorbitant rates from your group and from ours.

Gradually the companies themselves began to see the investment in spots wasting away very rapidly and saw that there was something unsound about that subject. It took us a long while, I think, all around, to figure just why it was or how it was. It didn't seem to work as it did in other lines of business, and the companies began to realize that not only did it seem difficult for today but they could not see any way of working it out in future. The chances were that it might get worse instead of better.

Then came a long period that we have been through, a long period of trying to work out these unsound economic situations, taking the cases where the public was most insistent that there should be some change first. We have been through quite a period of doing just that.

During this period we were making all kinds of mistakes. Members of all groups were making mistakes and doing things that if we were going to do over again today, we would not do that way. I think some of you men during that period made mistakes. It was a kind of a set-up where it was easy to make mistakes, and I guess we all made them, a lot from suspicion and misunderstanding.

Admits Own Mistakes.

Meanwhile, what was it that made you suspicious of us? I am telling you why we kind of didn't like some of the things you did when you came in. Now, what made you suspicious of us?

Well, one thing was that in spots we did exactly what we said was not sound. We went into territory and competed with you when you were there first—just what you had been doing and we kicked about it. We did the same thing. Naturally you did not like it any more than we did.

I guess you had a better right to kick than we had, because we were saying it was an unsound thing and ought not to be done at all. That is the kind of thing that happens in a scrap. You do things that are not particularly sound and that you do not really believe in.

That is a thing that has made you suspicious of us. We continually argued all the way from the time we started in business that there ought not to be any duplication of telephone plants; in other words, that there ought to be monopoly in the telephone business in a given locality, a given city or town.

In those days it was pretty easy for each one of us to put the worst possible construction we could on the other fellow because we were always looking for the nigger in the woodpile. I think you construed that as meaning that we wanted a monopoly of the entire industry, which, so far as I can find out, nobody in the business in authority back through the history of time, ever thought about. If so, it is so far back I have not been able to get any track of it. Certainly it is the farthest from any one's idea now.

"Universal Service" No Monopoly.

We kept advertising national service, universal service. At the very start Alexander Graham Bell outlined the objective of the company as "service which should connect up the entire United States." In the charter of the American Telephone & Telegraph Co, the purpose as set forth is "to furnish service and connect telephone companies through the United States and Canada, so that communication by word of mouth over wire will be possible all over this continent."

I think you sort of resented that because you felt that there again national service meant that we wanted to own all the service in the nation. Of

course, you realize that is not so. There isn't any monopoly today, and yet there is a national service in which you men play a very large and a very important part.

Now, I am here to say that it was a mighty good thing that one of our groups, one of the groups in the industry, had the objective of national service. If one group had not, we never would have gotten there—and it is a good thing for us all, for the industry, that we have a national service.

It never would have been possible, probably, if one of these groups had not definitely been committed to reaching forward to national service. In no other way would the money have been spent except by the one group that had that objective. It cost millions and millions of dollars in research, experiment and development to get the long distance transmission developed to the point where it is today. The copper circuit and the transposition of wires took it from Boston as far as Philadelphia. Then the loading coil came along and took it as far as Denver. Then the repeater came and took it clear through to San Francisco.

No one company in our group, no one company in your group, would have ever had the faith, the courage or the ability to go ahead blindly and keep pouring that money in to push the art of transmission further and further and further; and no manufacturer ever would have dared to put that money into it, because he would not have been sure that he was going to find the answer and have a market if he did find it.

So I say that what we did as to our objective as to a national service was good for us; it was good for the industry; it was good for your group, and it was good for the public. But I do think the fact that we continually spoke about national service, and universal service you interpreted as meaning that we wanted to own the whole thing.

Standardization Misunderstood.

Another thing that we kept saying that I fear you misunderstood and resented—and from your interpretation of it I think you properly resented it, but I think you did not interpret it right—is that we kept talking about standardized equipment and standardized methods.

It was necessary, as we saw it—we thought then and we believe now that we were right—that in order to develop a national service you have to have pretty much standardized equipment and you have to have pretty much standardized methods; but again I think you tended to misconstrue our statement that we wanted for the service of our group and the national service, standardized methods—I think you construed that we were advocating methods devoted, not so much to national service, but to the more specialized and more essentially localized service.

Disclaims Equipment Monopoly Intent

Furthermore, we purchased all our equipment practically from one company, and I think you thought we were trying to make up a monopoly of telephone apparatus some way through the Western Electric. That was never so. It is not so today and it never was so; but I can see how very easily you thought that was what we were trying to do.

The Western Electric is simply a department of our group of companies, which, as I have said, have the objective of developing and perfecting national service. We very early thought—and we thought it a wise thing to do—that it was a good thing to have our own manufacturing company and own it; not have the manufacturing company own us but own the manufacturing company.

For that reason we bought the Western Electric Co. in order that we could buy the quantity and the quality that we needed; in order that we could be absolutely sure that we could get what we wanted when we wanted it; and that we, the people that were operating the telephone business in our group, could tell the kind of apparatus we wanted rather than to have somebody who didn't know exactly what our problems were tell us: "Here is the best thing for you."

To a certain extent, to a very large extent, we feel sure that that has proved right with us. We know that it has enabled us to get the benefit of standardization and giving the companies that are going to use the apparatus the control of the apparatus. We know that it has enabled us to standardize to a much larger extent than we could otherwise. We know that it has given us the opportunity to manufacture at the lowest possible price.

We had an illustration the other day of what that means, if you can standardize down to the last minute, when we see this last production from the great Ford plant where everything is standardized to the last word. It simply means bringing the price of that automobile down, down, down, until it is the wonder of the world that they can produce that car and make a profit at the figure they do. It just shows what a valuable thing it is to have manufacturing processes standardized so far as possible and as few as possible special machines and special methods.

So we feel that that policy of ours, which we think you misunderstood, has really proved effectual and has proved good, and I believe that you will agree we are right on that.

But the point I want to make is, I think, perhaps, you misunderstood it and felt, perhaps, what we were doing was to monopolize the manufacturing field. As I have said, that is not true. We have not hesitated ever to go and buy rather than manufacture equipment and apparatus that we needed and could use and that would weld into our system, and we are doing it in one or two instances on a substantial scale, as probably you know.

Reasons for Hatred Vanish.

I have gone into some of the reasons of this misunderstanding of the past for just one reason—to show that the reasons for the misunderstanding in the past are today pretty much disappearing. That is, it seems to me we can put them behind us, and they are not going to trouble us in the future as perpetuating any misunderstanding as between the two groups and the members of the two groups.

And I want to say that, in my judgment, there never was the opportunity that there is today, this minute. Never were conditions so good and never was the necessity greater than it is at this minute for the two groups, if they desire to do so, to co-operate and work together on their identical interests and problems for the benefit of the industry as a whole.

The misunderstanding has pretty much disappeared. We have gotten a good deal better acquainted with each other than we were 20 years ago and 15 years ago, and we have come to realize that a telephone man is just about the same kind of a fellow. It makes no difference which group he is in. We are all about the same.

It seems like there is a certain type of men who just naturally flock into the telephone business. They flock into one group as easily as they do in the other, and we have found by actual experiment that we can get along together mighty well if we really want to. The misunderstanding that there used to be because of our suspicion of your motives, and your suspicion of our motives, as we believe, may be practically eliminated by very frank statements between ourselves as to what our motives really are.

Now, I want to state briefly one or two of the reasons why, if I am right in assuming that there never was such a good opportunity for the two groups in the industry to co-operate and work together. I would like to state now one or two reasons why it looks to me as though it would be good business for us to do it.

Generally speaking, we feel that our interests are almost exactly identical. We still have the one apparent exception to that—perhaps the one real exception—that some of your group and some of our group in spots are still duplicating each other's properties. We have that old condition still existing to some extent that brought about, I think, a good deal of the trouble we had in the past in the industry.

But I think we all regard what is left of that as a sort of a legacy left in the development of the industry. I think we all regard it now, wherever it exists, as an unsound situation. What I mean by that is a situation which cannot exist as the telephone is going to exist, generation after generation.

I think we all agree that from time to time during the next year, the next five years, the next ten years or when, in spots here and there, the public will come to us and say: "Gentlemen, we think you have to work this out in some other way." And when that time comes, I take it we must get together and see what is the best thing we can do, and each one of us take our fair share of the burden in trying to work out some answer in each locality. In the meantime, however, I am sure we are going to get along in some way on a pretty good basis.

There is not the bitterness that there used to be. If we both understand that some day, some time, we have got to work out an answer that is in our interest and in the public interest, why we probably will get along pretty well together until that time comes, however distant it may be.

But the property that is duplicating property represents a relatively small group of the property owned by your group, and represents a relatively small proportion of the property owned by our group, so I want to eliminate that now from consideration.

Bearing that in mind, we can't see from our point of view, why our interests otherwise—the interests of the two groups—are not absolutely identical.

Problems Are Identical.

We have big problems ahead of us in the telephone industry, and the whole industry must present a unified front if we are going to handle those problems in the best possible way as we should do. We must present a unified front and, in dealing with these problems, we will get farther and carry the load easier and better if we do it.

Just one or two illustrations:

Here is the great common problem of our relations to our employes. If we are going to work out the answer in the industry right, we must have the co-operation of those employes in each group. We must have their loyalty and we must have them believe in the industry. Yet, as the last speaker just said, there are men going up and down the length and breadth of this land and trying to tell your people and my people that this minute now you don't care a whoop for them, that you are a mean, low-down, gasping bunch of cusses, and that they are different from your class, that there is a fight from now until a revolution comes between them and you.

If our employes ever believe that, goodbye to the telephone industry and the money invested in it. The threat is just as great to you as it is to us, and we shall handle that problem infinitely better if we will just touch elbows and put the whole weight of the management on both sides in working that out and meet the attack of these outsiders who are continually trying to make trouble in our industry.

Again, the public. We know that we are on a different basis in the industry than we were before the war. We are on a basis of increased—and, perhaps, increasing to some extent—costs. We cannot meet the economic situation today on low rates.

Here is one job that this industry has got, as I see it. We have got to teach the people in this country, from one end of it to the other, that telephone rates must be good, full, reasonable, able-bodied, adequate producing rates; otherwise they do not get the service, and they do not get the future development.

Commissions' Only Mistake.

We have got to let them know, and it is no easy job to do it, that there is only one mistake that the public service commissions can make about rates, only one; in the public interest there is only one mistake they can make, and that is by keepng those rates too low. They never can make a mistake by making them too high. They can correct them the next year, the year after. The trouble is in making them low, where it is hard for us and for the commissioners to get them up afterwards.

That point we must educate the people on. You cannot do it—we cannot do it—alone, but working together in time we can make the public understand that. We have a long way to go to protect the industry, and we must do that by working together.

The last speaker spoke about the tendencies going on, the dangers of adverse, freak and unsound legislation and this monkeying with the fundamentals of our government, and this playing with property rights, which are what your investment and our investment are based on. This whole question of public relations and getting a fair deal from public authorities who have tremendous power over us as public utility service corporations, is a tremendous problem.

It is not your problem; it is not our problem; it is the problem of the industry. If we can line up together and go at it together, we can do infinitely more in making those public relations right, correcting the attitude of the public in all respects to the industry than we ever can by traveling alone.

No Corner on Phone Brains.

Again, you have not all the brains in the telephone industry and we have not all the brains in the telephone industry; but in your group and ours, we have all the brains there are in the telephone industry.

All right! Let us pool them. Let us make them work together. Let us swap all the ideas that we can for the benefit of the industry—and if we do, the industry will be stronger, the art will go forward faster, and our investments will all be safer, and incidentally we will have a whole lot more fun on the job.

On Connecting Relations.

I will just outline a few of the cases in which we think our interests are identical. I just want to quote one apparent exception. I say "apparent" meaning just that. I don't think it is an exception. It is that we have, or a great many of us have, most of the people in your group have, contract relations with most of the people in our group in our connecting relations.

At first glance that might look as though our interests in that respect are hostile; but I want to say that if our relations are hostile there is something wrong about it. This contract that we have between these two groups, just as the contracts that lots of you people have among yourselves, are not bargains. They are not the ordinary, every-day horse trade. They are the setting-up and working-out and putting into written form a more or less permanent statement of a fair relationship between the two concerns.

Unless those contracts are equitable to each side, unless they are in the interest of each side, unless they are justly and equitably worked out as they can be, one side or the other is going to feel that it is not a fair contract. That is not what we want. It is not a contract. It is a permanent working base.

And so I say those things do not prevent our interests being identical; and when those questions come up between different members of any industry, I want to make a plea for sitting down man-fashion—for sitting around a table, putting your feet under the table and the tobacco on the table, and staying there until the feet get tired and the tobacco is gone, if necessary—to work out something that is right.

I have given you our feeling about the desirability of having two strong, closely knit groups in the industry. History has favored us in producing those two groups as they stand at this minute. I have told you what we feel should be the desirable relationship between these two groups.

Discusses "Hall Memorandum."

I want to talk a few minutes about when property goes from one group to another or vice versa, either way. That was the subject of a letter that I wrote Mr. MacKinnon last June, and I think it is probably a good thing to talk over a little, because, if we can have an understanding of each other's motives and desires in that connection, I do not see that there is any possibility of any misunderstanding or friction in the future over those occasional changes from one group to another. Then I do not see anything left in the situation that is likely to start up any misunderstanding or suspicion.

The purpose of the letter I wrote to Mr. MacKinnon was to try, so far as we could from our point of view, to set out our ideas, our motives. I think we ought to discuss it a little because I take it that it is absolutely inevitable that in course of time there will be occasional changes of property from one group, this group to that group and that group to this group.

It is inconceivable that just as the thing stands today it is always going to stand in that way. My letter to Mr. MacKinnon deals only with cases where we purchase property from some member in your group. That is the only thing that seems to make any trouble. When we sell our property, nobody seems to be disturbed about it, and a good many times you do not know about it. So it covers just that phase of it.

This letter was written last summer, in June, and it was just a little while after the announcement of the purchase of the Kinlock property by the Southwestern Bell. It seemed that, because of that purchase and one or two other similar ones in different parts of the country, there was a feeling on the part of some people in your group that what the Bell companies were going to do was to try to take advantage of the Graham act and go out and pick up all the Independent companies they could buy anywhere in the country.

That was not so, and, after talking it over with Mr. MacKinnon, I told him that it seemed to me the wisest thing to do was to say in just as unmistakable language as we could put it, that we had no idea of doing anything of that kind.

It was the logical thing, if you will stop to think a minute, that after years of the so-called Kingsbury Commitment, which simply tied the situation as it was—whether it was unsound, whether the public liked it, whether the people were losing money, whether the service was going to the devil or not, simply tied things as they were—it was inevitable that when that bar was removed and there was an orderly procedure set up by Congress under which some of these things could be worked out, it was inevitable that that stuff which had been sort of dammed up for a number of years should rapidly press to the front. But there was not a place where that was done where it was not under very heavy pressure from the public that was served and a demand from the public that none of the companies involved could ignore.

No Bell Buying Policy.

So in this letter the first thing I

stated was what I had stated repeatedly in our conferences with Mr. MacKinnon—that the report that the American Telephone & Telegraph Co. and associate companies had adopted or were about to adopt a general policy of buying either connecting or duplicating companies was absolutely without foundation, and I want to repeat that in just as vigorous language as I have got in my system to express.

I will say to you in all frankness that we have just as big a job as we know how to get away with in handling the responsibilities that we see ahead of us in our territory for the next five, ten and fifteen years. If we are able to raise the money, find the talent, and train the talent to carry out a good job in the territory that we now have, the responsibility of serving, we are going to be very, very happy about it, and the last thing on earth we want to do is to generally enlarge those responsibilities. We don't want to do it. We don't intend to do it. And more, I will say that I am stating the unanimous opinion of all the people concerned in the management there at headquarters.

Doesn't Want "Whole Darn Job."

Let me tell you a little story. You may have heard it. There was a family in a certain town where the man was rather a shiftless fellow. He was not industrious at all. He worked some but usually he didn't. He was poor. It was a poor family and still the family kept growing, and they had thirteen children. The church that he went to about half supported them. They had to send neighbors around there all the time to be sure the children were fed, and the people in the town were supporting that family, and still the family grew.

Finally along came No. 14 in the family. The church committee that had been carrying this load concluded that they were getting a little tired of it, and so three of the good sisters went down to talk with them. They went in, and the chairman said:

"Now, look here, Mr. John Huggins. We don't think you are doing right. You are just raising this great, big family when you can't take care of what you have, and we think it is all wrong. You are a burden on the community, you are a burden on the church, and it is not fair and it is not right."

John sits back there and says: "Well, now, Sister, remember I am just following out what it says in the Good Word. That is all."

She asked: "What do you mean saying following out what is in the Good Word?"

"Why," he said, "you read in the Bible, 'Marry and replenish the earth.'"

"Yes," she said, "but you show me any place in the Bible that says John Huggins has to do the whole darn job, will you"?

Now I expect the people in the United States have to have telephone service for the next 15 years; but we haven't any fool idea in our heads that it is up to us to do the whole job.

As I said in the letter to Mr. MacKinnon, if we do buy properties in the future here, there and elsewhere, it won't be in line with any general policy to buy them, but it will be an exception to our policy that we want to buy just as few as we possibly can, and that every case that comes up—and it is inevitable that cases will come up, as we see it—will have to prove in not as a part of a rule, a policy, but as an exception.

As outlined in the letter, there are two classes of cases. One was where the transaction seemed to be demanded either for the convenience of the public as evidenced by the wishes of state authorities or by local public sentiment in or adjoining the territory served. As we see it, that includes the typical kind of cases that would be included under that exception, places where there have been duplications, and the time comes where the public says: "You must find some way to work this out."

When the public says that to us, what are we going to do? We do not see anything to do but to get together with the public representatives and with each other and try to find some answer. We cannot do business; I mean to say, you can't, none of us can do business in defiance of public opinion. We have got to serve the public pretty much the way they want to be served or else we cannot expect much fair treatment from them.

In that letter, speaking of the cases like that, I have said this:

The solution of problems of this nature can be approached in any one of four ways, either (a) by the sale of our property; (b) the purchase by us of other company's property; (c) by some method of consolidation of the companies; or (d) by working out some division of terirtory.

It is perfectly clear to us that you cannot pick out any one particular method and say that is the method that ought to be used, because you have to take the local situation as to that and work it out in whatever seems to be, all things considered, the best way in the long run.

I haven't any question, however, in saying that if the thing is worked out right, if the situation is such that it can be handled that way, the one that we think is the best thing is by a consolidation of the properties where it is just a pooling of the two interests; the same stockholders more or less are retained, and the business just simply goes on as partners in merchandise, as it was in Ohio.

On Division of Territory.

I want to say, too, that on the question of division of territory, for any general division, dividing up of territory heretofore operated as one territory, we feel that, generally speaking, it is hard to find any sound way to do it. It is a forced, uneconomical, generally unsound way to do it. That is not always so, but we think it is generally so.

Then there are other cases. I will speak of those later. I am not going to try to touch all of those in detail, but I do want to state one or two more illustrations coming under this head.

Under the second heading—cases where "By special reasons which made the transaction seem desirable and essential from the point of view of the protection of our own property or the general public service"—I want to give a few illustrations and see if you do not agree that, as a business proposition, those cases have got to be considered when they come along.

I define that later in the letter like this:

"(1) Companies in which we now have a disproportionately large investment without actual control."

I will just ask you to put yourselves in our position. Would any of you gentlemen put any substantially large amount of investment into a telephone property where you did not have some kind of control or something to say about the management? It is not good business to do it.

If you are in the telephone business yourself and that is your job, any money that you have invested in the telephone business ought to be where you have some sort of supervision and some opportunity to carry the responsibility. Yet there are a number of cases like that where under public pressure, under the restrictive limitations that were on the industry during the Kingsbury Commitment, the public demanded that the properties get together and eliminate in some way the duplication. In some cases where that was done in deference to that pressure of public opinion, the elimination has worked out on what has proved to be a sort of unsound basis.

I have in mind several cases where the Postmaster General said, "We are in the war. We have to conserve everything. We must not have any waste at all. The war may last indefinitely." I think Burleson thought it could be done over night. But we got together and tried to work out something. Then we found that the government does not team-play as our departments team-play. One department says, "do this," and another says, "if you do, we will put you in jail."

So we had to work out something that would meet Burleson's demand that we economize during the war and put things together, and on the other hand we could not run counter to the Kingsbury Commitment.

In some of the cases where we have the largest amounts involved we accepted securities without any control whatsoever, and the control went to others who had a small amount in the business. Sometime or other those companies will come up for consideration, and I hope you will agree with me that it is just a business proposition that we have to meet. I want to make it clear, if we do consider them and take them over, it does not mean we are going out to get a lot of companies, because we are not. We have all the companies we want to handle.

Take the second:

(2) Cases where connecting company or other telephone property is pressed for sale, and where it seems that the general public service will be improved by its operation as an integral part of our service.

A Case in Point.

I want to give you a case right now that came to our attention within three months. This case is a small company. A man has put everything he has in the world in that company. He connects with one of our companies. The doctor has told him he must quit work, he must retire from business, and he has to go to another climate. What is that man going to do?

There is nothing he can do but to

get that money out. He has to get that money out in order to get to the climate the doctor says he must go to if he is to live two years longer. What is he going to do?

If he comes to us—we are contiguous territory to his—it seems to me it is pretty near a cinch. You don't want the village blacksmith to buy the property; he is not likely to buy the property. He is either going to your group or to our group. Your group or our group is the only market there is—and I think it is inevitable that one of us will have to buy. I would not say that out in public, because we may have to buy, you may have to buy.

Under those circumstances, you would rather not extend that way; you would rather use your money for development on territory you are already responsible for. But I do not believe there is any answer. I do not believe we can all of us say, "We do not care anything about the service in that town; we do not care about the property; we will let it go." We cannot antagonize the public in that way.

We are undertaking, you and us, to furnish the telephone service in this country. The public expects us to do it, and if in spots it falls out, one of us has to step in and take care of it. No matter whether it is a profit or not, no matter whether we want it or not, no matter whether we are equipped for it or not, one of us has to step in.

Another case, it is common case and I expect you men know a good many more such cases than I do, is where people have gone into the telephone business in perhaps a small way, put in a good deal of their own savings and their own capital in the business with the idea that they would go into it like they went into a store; that they would go into that business, make a killing, perhaps, and then retire with the profits they have made.

We know you cannot do that in the telephone business. It is not a question of a killing; it is a long continuous performance and success means not a big killing, but success means a steady, safe, sound return on your capital, and that is all.

There are very often cases where people who have gone into the business with that thing in mind decide they want to get out. When a case of that kind comes along, they are naturally going to you, or they are going to us to see if we will take that property off their hands. One of us has to do it. We ought to get together and talk it over when the application comes up to one of the two of us.

An Urge to Sell.

Another case is where a man has all his money invested in the telephone business and is getting 6 or 7 per cent on it. He has an idea where he can put that money into another business where he thinks he can make 15, 20, 25, 35 or 40 per cent.

What is he going to do? He has got to pull out and get his money over where he can get the big return. Whether he can get it or not is none of your business or mine.

There we are. If the public thinks we must take over this, I do not see but some of us have got to act. It is one group or the other. I could go on and state several different cases, but I think I have given you the typical kinds of cases that we think are going to come up—and it is inevitable that they should come up in the future.

There is a case in one of the states where a very prominent public official lives in a part where he has very poor telephone service. The particular man that is running the company rendering service in that community is giving all of his interest to some other business. He has let his telephone business run down and be run by a two-by-four man; to whom he is sort of farming it out.

This prominent man has come to our company in that state and said: "You have got to go in and buy that property and take care of the service."

We say that we do not want to; we have all we can handle.

"It is your business to do it," he says. "You are in business to give telephone service; you are a large concern and you have got to do it. This fellow doesn't know how to do it. He is interested in some other line. We want somebody to give telephone service who is responsible and can give service." We cannot ignore that.

That is another type of the cases that are going to come up for consideration. I have simply mentioned these types and some of the reasons for the exception to the general policy that we feel sure are going to come up for consideration by us as well as by you in the immediate future.

To Give Due Notice.

The rest of my letter to Mr. MacKinnon was about the arrangement that we have made for giving notice in any case where we are negotiating with anybody who comes to us and we really sit down and are actually ready to talk to them. We propose to give notice to your association so that if any transaction, which is even under consideration, involves any of your people or your interests in any way, there will be a chance for you to sit in on it so that our interests are protected.

At Mr. MacKinnon's suggestion we went farther than that. We agreed when these cases go to public authorities—there is going to be a hearing on it and it is going to be passed on by the public officials—we will give 30 days' notice before we file the application, so if we have not been able to find some way to protect your particular interest, if you have any in the transaction, there will be opportunity before the hearing and perhaps we can work it out.

In closing, I want to sum up what I have said.

We believe that it is in the interests of this industry—this telephone industry—to have the most cordial relations and the most constructive kind of a co-operative relationship between the two groups; that conditions I have generally stated existing in the industry, understanding ourselves and our jobs and the industry as it is, make it possible to co-operate for the benefit of the industry as we have never been able to do before; that in this country, as in all countries, the last word in everything is public opinion, and we must have public opinion right toward the industry.

Must Stand Together.

The public won't discriminate. The public won't say: "I know a telephone company that is all right, but I know another one that is not." They say telephone companies are good, or they are not. They talk about the industry.

They think of it in terms as they do about the railroads. What do people say about the railroads? Do they say:

"This railroad is bad and that railroad is fine?"

No; they damn the railroads as a whole throughout the country.

We cannot have the telephone industry talked about that way. We must get public opinion right to it and we can only get it right by working together. It is the biggest problem we have. If we get it in future, we are sure of fair treatment for the industry.

If you feel, as we do, we can work this thing out together with the finest kind of results. We will go farther; we will travel better; we will get there quicker, to success in both groups, if we work together.

I am simply here to say that our group will go half way, if desired, in any movement that you men make in helping protect our common interest and helping share and develop our common properties.

St. Paul, Minn.—L. O. Painter, formerly Equipment Engineer for the Tri-State Telephone and Telegraph Co. has been named acting Chief Engineer to fill the vacancy caused by the resignation of A. J. Seymour, who is now attached to the staff of the General Superintendent as consulting engineer.

Boston, Mass.—On January first, Dr. S. W. Stratton, for 21 years Director of the Bureau of Standards, assumes the presidency of the Massachusetts Institute of Technology, succeeding Dr. E. F. Nichols, who has resigned because of illness.

New York City.—"Wealth Invested in Public Utilities," by Edward B. Lee, reprinted from the Financial World, now is available in pamphlet form and is being distributed by the Electric Bond & Share Co., for which organization Mr. Lee is statistician.

Louisville, Ky.—A million dollar program of facility extension is announced by the Louisville Home Telephone Co.

Tampa, Fla.—Capitalization of the Peninsular Telephone Co. has been increased from $1,000,000 to $5,000,000 to care for the development of the next several years.

OPINIONS AND COMMENTS

A GREAT CONVENTION

Another Convention of the United States Independent Telephone Association has passed into history. To the casual observer, it may have seemed little different than other conventions of recent years. The routine of the meetings, the crowds in the well arranged exhibit rooms and the other outward features may have been little different than in other years except that a normal progress might have been noted.

The difference between this and other conventions was not to be found in the externals but in the spirit and attitude of the men in attendance. There was an optimism and a quiet enthusiasm that we have not had in recent years. It was not the enthusiasm of battle—the kind that animated the conventions of twenty years ago—but rather the enthusiasm of business men who believed in their business and in its future.

There have been many curious changes in the spirit of the conventions of the independent side of the telephone industry. At first it was the spirit of combat or of the conflict with the Bell interests during the early years of the development of the Independent telephone companies. Then followed a spirit of suspicion when no man trusted his neighbor and some of the most belligerent independents were suspected of having already made contracts for sale to the Bell. For a few years after the Kingsbury commitment there was a feeling of relief which was quickly followed by that of depression during the difficult days of the war period with its accompanying government control. This spirit of depression and uncertainty has persisted since the war on account of the stringent financial situation and on account of the apparent change in Bell policy following the passage of the Willis Law by congress.

There are many contributing factors to the spirit of optimism that has succeeded the depression of the past few years. In the first place there has been a definite trend toward the easing of the financial situation. This resulted in the placing of a considerable volume of orders representing a contribution toward improvement in the manufacturing end of the business. Then again there was the removal of the doubt as to the Bell policy and also as to the relation of the Association to the Bell interests.

For the first time in history a Bell official has appeared on the independent convention program to give an outline of the policy of his company. Vice-President Hall in his address, explained and amplified the statement of policy made in the "Hall Memorandum" and made it doubly clear that the Bell is not only willing but is anxious that there be a group of companies outside its control and that the Bell has no desire to absorb any company, now holding exclusive territory as long as that company cares to remain in the business and provide the service needed by the public.

The proposal of the Illinois State Association that the Bell be invited to become member of the national association did not meet with the approval of the majority and the association will continue to represent only the independent side of the industry as it has done in the past. This would seem to be the wiser plan for the present as the Association can continue to co-operate with the Bell where co-operation is advisable and still can represent its members in matters involving relations between the two sides of the business as it is at present organized.

Aside from the larger matters such as the definite assurance of the preservation of the independent group in the telephone industry and the maintenance of the independent status of the Association, there were many other matters of importance. Out of the convention grew the prospect of closer co-operation between the national and the state associations, the prospect of increased association activity in many matters related to the welfare of the business and the promise of added value of the association to its membership. Altogether it was a convention that men could be glad that they attended and from which they could go home with a new interest in the telephone business and a new determination to develop their properties and their service to maximum both of quantity and quality.

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GROUNDED LINES

Every publication in the telephone field receives annually a large number of queries for its question and answer department asking how cross-talk may be prevented on ground return lines. Invariably the answer must be given that cross talk can not be prevented on lines using the earth for one side of the circuit.

Sometimes the question is varied by the statement that the lines are

working on single wires through the cables because the capacity of the cable is not large enough. The answer in this case must be that there is no possibility of preventing cross talk between circuits working on split pairs in a cable. Foresight and a few extra cents per foot at the time the cable was erected would have provided the necessary pairs.

Other statements are that the telephone company can not afford or does not wish to make its lines metallic or to put up larger cable. If this is true, the only thing that it can do is to continue to give inferior service.

The larger and more progressive of the smaller companies have long ago abandoned the use of the ground-return line and TELEPHONE ENGINEER is firmly of the opinion that this practice should be adopted by the entire industry. The rapid extension of electric lines in all parts of the country will make this necessary even if the desire to give good service is not strong enough to compel action.

Every telephone company is compelled by law to set aside a reserve for depreciation. Many companies that have developed their territory to nearly the saturation point and do not find use for the unexpended portion of the annual appropriation in making extension. In what better way could it be used than in making improvements in plant by converting lines from ground to metallic?

If a company is not earning a depreciation reserve, it should take immediate steps to have its rate schedules revised so that it will no longer operate at a loss. If it is earning it can utilize the fund for improvements until the time comes when the money is needed for replacement. In this way it can gradually modernize its plant without undue financial burden.

The entire conversion does not have to be made at one time. As leads are rebuilt or overhauled the lines on them can be made metallic and gradually the grounded lines will be worked out of the entire plant.

TELEPHONE PIONEERS

As a man grows older he lives more and more in the past. The outlook of youth is toward the future while the outlook of age turns more and more to the past. Youth is alert and is ever looking for new paths while age gauges things by the experience of other things that have happened. Both have their place, the conservatism of age is needed to temper the enthusiasm of youth. The youth of the telephone people is represented by the thousands of young men and women who come into the industry each year. Those who have spent long years in the service are the age.

As experience ripens and as age comes on, men more and more like to gather and renew old acquaintance and talk over the happenings of bygone days. Without this characteristic of human nature we would have no history and without history we would have no progress. No nation without written history has left an indelible mark on the progress of the world.

In the telephone field there are two organizations devoted to the past. Roughly the division between them is the division of the industry. Both have held meetings recently, one at Cleveland and one at Chicago. Largely social in character, these meetings have nevertheless contributed to the progress of the business as every meeting of this character adds something to the recorded history of the communication art. May the two Pioneer Associations prosper, for they not only give the opportunity for pleasure to their members by providing meeting where those who attend may talk over "those good old days" but they also play a real part in the development of the telephone, just as their members played their part in the days about which they love to talk.

FACTOR OF SAFETY IN LINE CONSTRUCTION

Several weeks ago, the technical editor of this paper sent out a letter to a number of telephone managers in the sleet belt and asked them to contribute a few ideas on the subject of preparing in advance for sleet storms. Three of the letters received in reply were published in the October number of TELEPHONE ENGINEER. These letters state the ideas of the writers so clearly that they are well worth careful re-reading and study.

One notable thing about them is the unanimous opinion of the writers that the best insurance against sleet storm damage is the construction of lines having the proper strength and the maintenance of the lines so that the strength is unimpaired. The use of short, heavy poles, set thickly and storm guyed at frequent intervals is recommended as the ideal type of construction.

The importance of proper strength of construction as pointed out by these men—and they are men whose opinions must command respect—suggests some comments on the hit-or-miss methods that have been followed in much of our line construction.

An engineer in designing a bridge truss or the steel frame of a modern office building calculates the load that will be placed on each member of the structure. He then multiplies the expected load by a quantity which he calls the factor of safety. The various members are then designed to carry, not the expected load but the expected load times the factor of safety. They are made to be from two to perhaps ten times as strong as the expected load requires and the additional strength constitutes the insurance against failure.

It is probable that a considerable percentage of the poles lines in service today have a factor of safety of less than one when the ultimate ice and wind load is considered. This is true not only of the lines of the smaller companies which have been built without consideration of the load that may be expected but also of the lines of the larger companies whose line specifications take into account storm conditions. In the latter case the necessity of providing additional circuits has led to the placing on the pole line of more wires than the poles were designed to carry.

Substation Protection Views

Telephone Companies' Angle of Substation Protection is Surveyed in Address at Independent Convention—Where Protection is Required—Is the Need Urgent?

By R. V. Achatz

The protection of the telephone substation against electrical hazard is a matter of interest not only to the telephone owner but to the public as it involves, not alone the protection of the property and employes of the telephone company, but of the property and persons of telephone users as well. For that reason public bodies like the Fire Marshal's Departments of the various states and quasi-public bodies like the Fire Underwriters have been studying the situation with a view of making such regulations as are necessary to give adequate protection to the interests of the public. Thus far there has been little regulation except in certain places some attempt to enforce the general specifications in the National Electric Code and the approval by the Underwriters of different forms of protectors that have been placed on the market. This situation is not likely to continue and telephone companies must look forward to the possibility that they may in the future have to install protection in accordance with specifications which are not entirely of their own making.

It would be a difficult matter to discuss substation protection adequately, even if much more time were available than the program of a crowded convention offers. In the first place, the question of substation protection is one phase of a much larger question, the protection of the entire telephone plant. The kind, location and operating characteristics of the substation protective equipment may be affected profoundly by the character of the remainder of the telephone plant and the type of equipment installed for its protection at places other than at the substation. Then again, the protection engineer is handicapped by the totally inadequate store of scientific knowledge of some of the hazards against which he must design his protective equipment. That energy that may be transferred to a telephone line from sources outside itself frequently reaches enormous proportions so that the line itself is unable to withstand the high potentials or to carry the heavy currents developed and destructive discharges take place burning up wires and shattering poles and cross arms. It must be recognized that it is impossible with the present state of our knowledge to design protective apparatus that will afford absolute protection just as it is impossible to design block signalling apparatus that will be an absolute protection against railway accidents.

In the short time available it will only be possible to discuss in a very general way the character of the hazards and the types of protection against them. Present practice in the application of these protective means will be indicated. Where practice differs it is, and probably always will be, largely a matter of engineering judgment as to what is the better method. Knowledge of the subject can only lead to a certain point and after that it becomes a matter of judgment. As far as possible expressions of opinion will be eliminated from the paper but where it is necessary to express an opinion, the attempt will be made to indicate that it is an opinion rather than an established fact.

Reasons for Substation Protection

The protection of a telephone plant from electrical hazards must contemplate first, the protection of the life and persons of telephone users and telephone employes and second the protection from damage of property of the telephone company and the property of others. If the only question involved were the protection of property, the entire subject would become an economic question. The problem would be the determination of the best economic balance between the damage to property and the annual cost of the protective equipment. Since the question of personal injury and possible loss of life is involved, the economic side of the problem is overshadowed. It becomes necessary to consider factors other than the purely economic factors that enter. This is the reason that the application of protective means will always be a matter of opinion and judgment.

The protection of the substation being a part of the general protection of the plant must of course take into consideration the two reasons for protection just given except that the matter of protection from personal injury is of more importance than in some other portions of the plant. It must not be assumed, however, that protection **of** the substation means protection **at** the substation. This may not always amount to the same thing and protection in other portions of the plant may afford a measure of protection of the substation.

Electrical Hazards

The electrical hazards which make necessary the protection of the telephone plant may be grouped into two classes which, however, are not mutually exclusive. One of these hazards is the presence on the telephone line of a voltage higher than that for which the line is designed. A potential of sufficiently high value may be built up between the line and earth or between the wires that the insulation will not withstand the stress and a discharge will take place. The energy liberated in a disruptive discharge due to a high potential on a line may cause considerable damage in its path as is evidenced by the shattering of substantial poles and other structures or the puncturing of high insulation. If a person is in the path of the discharge or comes into contact with the wire before it is discharged, severe electric shock or even death may result.

The second type of hazard is due to current flow in the wires of the telephone system. If the potential due to the disturbing source is not sufficiently high to cause a distructive discharge, a current may flow in the telephone wire to a ground somewhere on the circuit or may flow through some of the devices attached to the line. Heat is generated and the result may be the overheating of the wire or some part of the apparatus. This heat may be sufficient to burn out a winding or even to cause fire in some nearby inflammable material.

Types of Protection

Since one of the electrical hazards to which a telephone line is subjected is the danger of a high potential discharge, it follows that one form of protection should be of a type that will prevent damage from this source. No amount of care in construction will entirely remove this hazard when

it is due to possible cross with high voltage wires and when it is due to lightning it is impossible to control it at the source in any way. Therefore the design of the protection must take the form of a device that will relieve the tension once it has been created. The familiar type of protection is the open space protector so familiar since the earliest days of the industry. The purpose of the open space protector whether it be of the carbon block, vacuum or any other type is to provide a path for the discharge which is thus localized at the protector. For telephone lines which in their ordinary operation do not carry high voltages, the gap is made very small. In the ordinary carbon protector it is of the order of .005 inch and the breakdown voltage is in the neighborhood of 350 to 600 volts.

The ordinary protection against the current hazard is the fuse. Fuses for telephone protective apparatus are made in many forms but there is a decided tendency to adopt the enclosed type or pencil fuse. It may be mentioned that there is a lack of uniformity in the manner in which fuses are rated. In power practice the rating of a fuse is 80% its safe carrying capacity for continuous operation. Some manufacturers of telephone fuses follow the same practice while others have adopted a rating based on the current that will blow the fuse. This is rather an unfortunate state of affairs as it is necessary not only to know the rating of the fuse but the method by which it was rated. Where both fuses and open space cut-outs are used the arrangement of the two is such that, if a discharge takes place at the gap and a heavy current flows through the gap to ground, the fuse will operate opening the line.

One common misconception regarding the operation of the fuse protectors may be mentioned. This is the belief that the fuse furnishes protection against the high potential hazard. The fallacy of this may be seen when it is recalled that the current must flow through the fuse before it can blow so that any damage due to the high potential would occur before the fuse would operate.

On account of the lack of reliability of fuses of small current ratings another type of protector called the heat coil is used, principally in central offices although it has been used to a limited extent in local battery substations. Another protective device sometimes used on telephone lines carried on the same pole lines as high voltage transmission lines, is the insulating transformer. Neither of these devices call for special discussion in this place, as the code does not require their installation at the ordinary substation.

When Protection is Required

Although there are many different types of protector and although there may be some difference of opinion as to the merits of the various designs, there is not the wide divergence of practice that has grown up in the manner in which the protective apparatus is installed. Engineers may be agreed fairly well that protection is needed and may even agree on the type that is needed but they have widely different views on the question of where and when protection is required on different kinds of lines. All will agree that there is a certain class of subscriber line which may be called "unexposed" which does not require protection of any kind. Such a line would be a line extending from the central office to block in which the subscribers' premises is located entirely in underground cable where there is no exposure either to power circuits or to lightning. Other types of line may be classed as "exposed" where the wire or cable for part of its length is exposed to the hazard of nearby electric wires or to lightning. Such lines require protection at certain places along the line. Some lines might be considered to be partly exposed where either the electric line hazard or the lightning hazard is absent.

Protection of Exposed Lines

In the protection of exposed lines, the telephone field is divided into two rather well defined groups, the one made up of the Bell Companies and those companies which follow Bell practices and the other group being made up of rather a large number of independent companies. The difference between the two groups seems to center around the use of protected and unprotected terminals for cables. Bell practice at the present time uses unprotected terminals on the aerial distributing cables, placing a fuse protector at the junction of the aerial cables and the underground cables. The length of the line attached to the cable terminal is reduced to a minimum by a liberal use of distributing cable but where the lines are more than one-half mile long an open space protector is mounted on the cross arm at the cable pole. A substation protector consisting of a fuse and open space cut out is used at each substation being located as near to the point of entrance of the subscribers' drop wire as practicable and grounded to a good ground with No. 18 copper wire run in as direct a manner as possible.

In independent practice as classified above, the cables are ordinarily terminated in a cable terminal having both fuse and open space protectors. This practice is followed regardless of the length of the subscriber line from the cable terminal to the premises. Even though the line may be exposed to hazard between the terminal and the subscriber's premises the cable terminal protector is depended upon to supply protection. Therefore, no protection is installed at the premises.

Adequacy of Independent Practice

The entire question of substation protection as it arises at the present time seems to hinge upon the matter as to whether the protection installed by independent companies as described above provides adequate protection for the property upon which the telephone is installed and for the person of the telephone user. There is no doubt that a properly installed protector at the cable terminal will afford some protection in the case of a cross with power wires or during a lightning storm but the protection is designed more for the cable than for the subscriber line. There are many, however, who contend that the subscriber line is better protected in this way than when individual protectors are installed at the substation. Some of the arguments advanced in support of this contention are the following:

1. Fires and property damage and personal injury have occurred in many cases even where an approved substation protector has been installed properly.

2. The location of the ground at the terminal instead of at the premises causes the heavy current that flows after the discharge occurs to flow away from the premises instead of toward the premises. To these are added certain economic arguments:

1. The additional expense of the substation protector installation is not necessary.

2. The location of the protector at the cable terminal where it is always accessible reduces expense of maintenance and interruptions to service as the trouble can always be cleared immediately whether or not the subscriber is at home.

Considering first the economic arguments, it must be admitted that they have some merit. It is probable that the first cost and the annual charge on a protected terminal is less than the aggregate first cost and the annual charge on an unprotected terminal and the necessary substation protectors although this will depend much upon the number of stations working out of a given terminal.

There is no doubt about the greater ease of clearing trouble and the lower cost where the protective apparatus is always accessible to the repairman.

Referring to the other arguments advanced, it can not be denied that damage and personal injury have occurred in spite of the installation of the best known type of substation protection. It is equally true that damage and personal injury have occurred where no protectors are installed. The validity of this argument then will depend upon the relative amount of damage and personal injury that may occur with and without protectors at the substation. As far as known there are no reliable data on this subject and therefore one man's estimate is as good as that of another. As for the second argument that current is conducted away rather than toward the subscriber premises, this must be admitted as true in most cases. The fact that is overlooked by this argument is that the operation of the protective apparatus at the cable terminal does not always clear the line of the hazard as far as the substation is concerned. For example, if it is assumed that the subscriber line becomes crossed with a 2300 volt electric supply line, an arc will form at the carbon protector at the cable terminal and as a result of the arc and the flow of current to earth, the fuses will blow. This relieves the cable and the central office but there is still danger at the subscriber station since the line is not opened in that direction. If a protector were located at the subscriber premises, the blowing of the fuse would clear the inside wire and instrument from further hazard.

The conclusion that must be drawn from this is that the substation protector will afford protection to the premises and the user in some cases where protection at the terminal alone will fail to give such protection, although it must be admitted that, in many cases, the cable terminal protector will provide sufficient protection. This is one of those personal opinions referred to at the beginning of the paper but it was arrived at by a study of all the conditions surrounding the matter of protection and it is the judgment of the writer that it counterbalances all of the arguments in favor of omitting the substation protector. It must be admitted from a legal viewpoint, the position of a telephone company will be much stronger in case of suit involving damage or personal injury if it can show that it has the best known protection at the subscriber station.

Should Telephone Companies be Required to Install Substation Protectors Immediately?

While the writer has stated his personal opinion that the installation of an individual protector at the substation gives a more uniform protection under all conditions, he does not admit that many times a station is not adequately protected without such individual protector, nor does he admit that all personal injuries and damages that occur in places where no protector is installed would be prevented if station protectors were universally used. While he believes that every company for the protection of itself and its users should adopt the policy of installing station protectors and should work toward the universal use of such protectors on its exposed lines, he does not believe that immediate installation of protectors at every substation should be required by public regulation or through the motion of the company itself. Twenty or more years history of the telephone business in which tens of thousands of stations have not been equipped with station protectors does not reveal any terrible slaughter of telephone users, or abnormal amount of property damage. The number of people injured annually while using the telephone is infinitesimal as compared to those injured through the use and abuse of the automobile.

This does not mean that we should be satisfied with things as they are. By all means let us have some authoritative body study the question and clear up many of the disputed points. Telephone men have much experience with the interruptions to service that are caused by the operation of the protective devices and naturally wish to keep these interruptions down to a minimum that is consistent with adequate protection of life and property. In some cases where regulation has been attempted the matter has not been presented in just the right way and they may be excused for considering the action somewhat arbitrary. If a Committee in which they can have confidence could study the matter and decide upon a specification that can be shown to give the required protection without unduly increasing the interruptions to service, the greater number will fall into line, adopting the specifications and putting them into use in their plants as fast as practicable. It would seem that this Association should be competent to take some action regarding the matter and its representative should have an active part in the work of any Committee that would undertake the solution of the problem.

HEAD BIG BANK

Telephone Magnates Get Control of Biggest Bank West of Mississippi River

Kansas City, Mo.—For a consideration in excess of two and a quarter million dollars, a syndicate composed of Theodore Gary, A. F. Adams, H. L. Gary, F. H. Woods and others, has purchased the controlling interest in the Commerce Trust Co. of Kansas City. The Commerce Trust Co. is the largest banking institution west of the Mississippi River and has approximately one hundred million dollars of deposits.

Mr. Adams has been elected Chairman of the Board of the Commerce Trust Co. Theodore Gary has been elected a director, and H. L. Gary continues as a director. Mr. H. L. Gary also is a director of the Central Trust Co. of Chicago.

Demands of Commerce Trust Co. duties have necessitated the retirement of A. F. Adams and H. L. Gary as members of the Board of Directors of the United States Independent Telephone Assn.

The retiring directors have been active factors in the organization's progress and their inability to continue on the directorate has been the cause of regret to the Independent telephone industry.

H. L. Harris, Vice President of Theodore Gary and Co. continues as a director of the Independent association and will serve on the executive committee in Mr. Gary's place.

"Telephone News" Jamestown's Miniature Phone Paper

Jamestown, N. Y.—A newspaper within a newspaper is "The Telephone News," which is the form the advertising of the Jamestown Telephone Corp. has taken. This condensed newspaper is composed of concise items, written in newspaper style and inserted in space three columns wide and ten inches deep in a Jamestown newspaper. John H. Wright, Vice President and General Manager of the utility, and an ex-newspaper man, is the originator of the idea.

BACK ISSUES WANTED

Copies of the January, 1922, February, 1922, and May, 1922, issues of TELEPHONE ENGINEER are wanted to fill extra copy orders. Subscriptions will be extended two months for each copy of the desired issues sent.—Circulation Department.

TELEPHONE ENGINEER
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Valuation in Rate Making

Chapter IX—Depreciation

By Charles W. McKay, Associate Editor

We have already seen that—aside from its relation to the accounting phase of our problem — depreciation plays a most important part in the determination of the value of any public utility property. As suggested in the last instalment, we must guard against confusing depreciation as considered in connection with building up the reserve fund for depreciation and depreciation as a factor in determining the present value of a property. These problems are entirely separate, and are not interrelated in any way—except insofar as the determination of average lives and salvage values is concerned.

To substantiate the writer's contention, several well-known authorities on the subject of depreciation will be quoted. Professor Earl A. Saliers, of Yale University, in the preface of his "Principles of Depreciation," says:

"The depreciation problem may be viewed from two standpoints, that of the accountant and that of the engineer. The engineer deals with physical conditions, such as steady plant deterioration, the necessity of replacement, etc. The accountant devises the ways and means of recording in the most intelligent manner the facts in connection with the changes. The work of the two should be correlated through a common understanding of the character and the extent of depreciation. The engineer having shown what the rate of depreciation is, the accountant suggests devices for recording it, for providing replacement funds, etc., and thus for the preservation of capital values."

In an article published in the "New York Journal of Accountancy," several years ago, Mr. John J. Thomas said:

"A correct understanding of the function of the accountant and that of the engineer as it relates to valuation and depreciation is the first step toward correlating the work of the two and harmonizing two entirely different, but equally logical, points of view. One covers protection against loss through the property's damage or destruction; the other protects the financial solvency of the concern by anticipating additional depreciation likely to occur through probable improvements in machinery and methods, based upon experience in any particular line of endeavor.

"The appraisal engineer has the task of measuring the amount of depreciation due to wear, tear and obsolescence that has actually taken place. The accountant's duty is to add to the percentage of depreciation annually occurring a percentage sufficient to provide a reserve fund for future contingencies, and the gradual replacement of the property. It is often larger than necessary to be safe.

"If this fundamental difference is kept in mind, there will be no feeling on the part of the engineer that the accountant is 'depreciating' the plant values excessively; nor will the accountant on the other hand view the depreciation made by the appraiser as closely inadequate.

"Putting the proposition in a mathematical form, let 'x' equal the amount of actual depreciation that has taken place, 'y' equal the amount of increase to provide a reserve fund for future contingencies and replacement. The function of the appraiser is to ascertain the value of 'x'; the function of the accountant is to take 'x' and determine what 'y' should be. Manifestly, if the appraiser terms 'x' the actual depreciation, and the accountant declares that 'x' plus 'y' is the actual depreciation, they will never agree. This show that there should be a careful study that would lead to a mutual understanding of each other's views of depreciation, so that when one says, 'This is the actual depreciation,' it will mean the same thing to both. It will also be observed by this formula that the accountant is dependent upon the appraiser in order to know the amount of 'x'."

Renewal Fund

The claim is sometimes made that the plant has depreciated to an amount represented by the balance to the credit of the renewal fund. Mr. Thomas shows, however, that engineers are, for the most part, following the practice of using so-called standard tables in estimating depreciation, and making deductions in proportion to the age of the plant. To quote further:

"The establishment of renewal funds through 'depreciation' annuities can be likened to the accumulation of a fire insurance fund on a building. A building that has not yet burned has certainly lost none of its value by reason of a fire insurance fund existing to insure it; neither has a plant lost value because of a renewal fund that exists to insure its gradual or final replacement. On the contrary, the fact that such a renewal reserve is being maintained is the strongest argument that all that is possible is being done to provide against impairment of investment and impairment of efficiency.

"It is obvious that the renewal fund will accumulate faster than is really necessary in the earlier years of a plant's history, because the replacements during the earlier years will be comparatively few; but that after a number of years the expenditures for replacements and the contributions to the funds will somewhat more nearly balance each other.

"It is evident that the percentage of depreciation that would show the present value should be a different amount from the percentage used to establish a renewal fund. Some authorities call the latter 'theoretical depreciation.' It might better be termed 'safety-first depreciation.'

"On the other hand, it is as wrong to take only the actual depreciation and say that it is a sufficient amount to provide for replacement. Actual depreciation is an impairment of capital, while the additional depreciation is a provision to preserve capital intact. Some authorities hold that it makes no difference, and that the appraisal engineer is not interested in the purpose for which the valuation is to be used. So far as ascertaining the reproduction value is concerned, this is true; but it does not apply to the percentages that are deducted from the reproduction value. In other words, the expert should know for what purpose his depreciation figures are to be used, and the depreciated value should state what it intends to

show. This does not affect 'the basis value of new replacement'."

Certain peculiar conditions arise in figuring the actual depreciation. The example used by Mr. Thomas is the calculation of the sales value of a property to be removed and used elsewhere. As an example, he cites the removal of a special machine to some other place in connection with some use other than that for which it has been installed. This removal might necessitate such a large expenditure for modification of design so that it might be useful, that it would have little value after the expense was paid. The sales value, therefore, would necessitate a large percentage of deduction from its value to a going concern in its original place. The heavy percentage of depreciation would necessarily be absurdly large. It follows, therefore, that if these different deductions are termed depreciation, correct estimates for one purpose may be incorrect or inadequate when applied elsewhere.

To maintain the plant in efficient condition through repairs and minor renewals paid from current income, is a wise procedure. The final renewals are made as required, and the cost is debited to the renewal reserve account. When renewals are made and the reserve account is debited because of liability for future renewals, it is important that the expenditure therefor should be charged against "Renewal Reserve Account" and not against the year's operating expense, otherwise the reserve would be building up indefinitely. One authority gives the following points, which should be kept constantly in mind in studying the problem of depreciation.

"1. The renewal fund is set up for the purpose of spreading the cost of gradual renewal of plant units as uniformly as possible over the expectancy of life period, thus obviating unnecessary fluctuation in cost of operating, and so making it more practical to keep loss and gain balances as uniform as possible and preventing sharp fluctuation in dividends or losses.

"2. The amount to be so charged annually to loss and gain and credited to renewal-reserve account, is an estimate or assumption of the effective life of the unit, based upon past experience and future probable possibilities.

"3. The loss will not have to be met until replacement actually is made. Loss is an accruing liability resulting finally in a decrepitude depreciation not yet due. Therefore, if the year's share of accruing liability is taken, and the payment is not yet due, it is held by some that the fund should receive the benefits of interest accumulated until the time for payment arrives.

"4. So far as the plant's capacity for rendering efficient service is concerned, it by no means follows that the plant has depreciated to the extent of the balance to the credit of the reserve. In fact, the contrary is nearly always the case."

The opinion is often expressed that appraisals are of limited application by the accountant. It is possible that this view has been caused by a lack of understanding and appreciation of the subject, and also by the fact that neither the owner nor the accountant —nor possibly the appraiser—fully understand their value.

The expert accountant, who should be one specially qualified to analyze, will find many uses for an appraisal if it has been correctly made.

Some of these uses are as follows:

1. To assist the accounting department by correcting past errors, preventing future errors arising from incorrect charges to plant account and to maintenance, and by providing a correct plant distribution.

2. As a basis for a complete analysis of unit costs of production with a view of effecting economies. Every unit cost contains the element of interest on the investment in the part of the plant used for producing the unit in question. Therefore, no complete cost of production can be ascertained without knowing the value of the part of the plant involved in the production.

3. To disclose where renewals are urgent or are likely to be necessary in the near future.

4. To determine the amount of existing depreciation that has accrued.

5. To show whether the cost of renewals has been capitalized instead of being charged against operating expense, and a falsely increased capital account been created thereby.

6. To use as a guide in estimating maintenance expense, thus providing a standard by which to judge the efficiency of management and to show true net earnings.

7. To use as a help in judging the degree of efficiency, for the reason that true efficiency is indicated, not by a large investment in plant, but by the least investment consistent with adequate service.

8. To use as an inventory, to disclose unremunerative pieces of property, and to detect property losses due to carelessness or theft.

9. To determine in advance the amount of money necessary to replace the various units of property as they are worn out, thus determining the total amount to be set aside to the renewal-reserve account, for which the accountant has to make provision.

If the relative positions of the accountant and the appraisal engineer are clearly defined and understood, there will be no contradiction between them. There is urgent necessity for co-operation between accountants and appraisers so that the public may be educated as to the work that each is expected to do.

At the present time there is need of constructive thought on the subject in order that the owners of property may be enlightened so that they will see the essential justice and correctness of the accountant's position, as well as that of the appraiser. The owner who has an appraisal is protected from loss through fires (insofar as the buildings and actual office equipment are concerned); but he is not protected against bad financing. The accountant saves the owner, in that respect, from taking false views of his financial situation.

If there is to be any uniformity of views, the subject of depreciation, it must be brought about by starting with a standard uniform basis of values. The logical basis to start with is the cost to reproduce the property new. If accountants, appraisers, and engineers start from the reproduction basis, there is the opportunity intelligently to analyze and compare their findings. Where each starts from a different basis the results make any comparison hopeless.

The question of uniform methods is far from settled. It is manifest that a full understanding of the elements of valuation and depreciation is necessary. An important one of these elments—one which has heretofore lacked adequate attention—is a standard uniform basis of valuation. The determination of the proper starting point is a long step towards the solution of many depreciation problems.

Practical Application of Depreciation to Appraisement

The subject of depreciation may, therefore, be subdivided into classifications:

(a) The determination of actual accrued depreciation—as found by in-

spection—for determining the true present worth of the plant.

(b) The provision of ways and means for building up a reserve fund adequate to replace plant after it has lived its useful life—in other words, after it has become worn out, or obsolete.

Determination of Present Value

We will now consider the present value phase of our problem. For obvious reasons, the depreciation of public utility property differs radically from the depreciation of industrial property.

As an illustration of the method pursued we will follow through a set of brief instructions for finding the present sound value of a typical telephone property.

As previously suggested, the present condition of the various component elements of a telephone property should be obtained at the time the inventory is recorded. The condition should be either recorded directly in per cent—or by a code system which represents a range of percentages. To illustrate, in connection with poles—if the code system is used the letter E may be used for poles in excellent condition; the letter G for poles in good condition; the letter F for poles in fair condition and the letter P for poles in poor condition. Expressed in terms of percentage, E would range from 100 per cent to 95 per cent condition; G from 95 per cent to 50 per cent condition; F from 50 per cent to 25 per cent condition, and P from 25 per cent to 0 per cent condition. We will consider briefly the proper method of determining the present condition per cent of the various component elements of a telephone property.

Land. Land is not depreciable. Its present value is always the same as the reproduction cost.

Buildings. A careful inspection should be made of the buildings—giving due consideration to type of construction, and all of the elements entering into its present condition. After this has been completed, a weighted average condition per cent should be assigned to each building.

Right of Way. Two methods have been advanced for determining the present value of right of way. Some engineers contend that right of way is non-depreciable—as in the case of land—while others contend that right of way should have the same condition per cent as the poles—other structures—occupying it. The writer is inclined toward the latter viewpoint.

Pole Lines. In connection with the inventory of pole lines—the appraisal engineer should carefully observe the general condition of the line in question. To supplement the general observations, every tenth pole should be examined in detail. The earth should be tamped—at the ground line—and a sharp, pointed iron bar used to test the pole. Very elaborate methods have been devised for determining condition of poles—but it is thought that for ordinary purposes the following will suffice. The sap, or surface, wood rots rapidly—usually within the first year after the pole is set. Hence, a rot of from ¼ to ½ inch of sap wood is not indicative of an unsound pole condition. If the bar test shows more than ½ inch of rot, the condition of the pole should be graded accordingly—dependent upon the size of pole and the amount of rot.

In the case of the city plant, each pole should be conditioned—the condition of the poles between the inspected poles, being dependent upon general conditions, and upon the conditions as found at the inspected poles. A weighted average condition percentage should be obtained from the inspected poles.

To illustrate the method used, the actual procedure in a recent appraisal will be described. Class E poles were assigned a condition of 97½ per cent; class G poles, 65 per cent; class F poles, 40 per cent, and class P poles, 15 per cent. There were 1,017 poles in the section under consideration. Of these 1,017 poles, 12 were found to be in excellent condition; 815 in good condition; 171 in fair condition and 19 in poor condition. Applying the percentage above mentioned — the average condition of the poles in excellent condition was 11.7 per cent; the average condition of the poles in good condition, 529.75 per cent; the average condition of the poles in fair condition being 68.4 per cent and the average condition of the poor poles, 2.85—making a total of 612.70; 612.70 divided by the total number of poles, 1,017, gave a weighted average of 60.2 per cent for the section in question.

A similar method was adopted with respect to the cross-arms—enough cross-arms being inspected in detail to supplement the general observations of the appraisal engineer as to the condition of the cross-arms. A weighted average condition per cent should be obtained for each section. Also, in a similar manner, a condition per cent of the anchors, guys, etc., should be obtained—although they are often assigned the same condition as the pole lines they support.

In the case of rural poles it is not, as a result, necessary to inspect as many poles in detail—and as indicated on the field form—the condition is not specified for each individual pole, but rather for the "run" in question.

In connection with the pole plant, the appraisal engineer should supplement his observations as to rot at the ground line by careful observation to determine the presence, or absence, of deep fissures or checks in the poles.

Line Wire. A similar method is adopted in determining the condition of line wire and drop wire. Sufficient detailed observations are made to check the accuracy of the general observations. Condition percentages are assigned, and if the code system is used, the lower limit of the percentage assigned to P (poor) will be largely dependent upon the salvage value of the wire in question. Copper wire, for instance, has a high salvage value, while iron wire has a zero or even a negative salvage value.

Aerial and Underground Cables. The condition of aerial and underground cables will also be determined by the percentage method. In the field, the engineer will carefully note the condition of the sheaths of the cables and this information will be supplemented in the office by a check as to the number of defective pairs, and all available data as to the rate at which cable is "failing." For instance, if a certain cable is being investigated and it is found that there are a relatively large number of defective pairs and that a much greater number the year following and a still greater number during the year of the appraisement—the engineer will be justified in assuming that the cable is "failing" fast and that the condition per cent is relatively low.

Underground and Aerial Cable Terminals. The condition of underground and aerial cable terminals should be determined by a careful, detailed inspection. If the terminals are of standard modern type, it is not necessary to inspect all of them—and the engineer will probably be justified in assuming that the terminal equipment is in good condition. If terminals are obsolete, of wooden construction, however, each terminal should be inspected carefully, and graded separately as to condition per cent.

Underground Conduit System. The life of underground conduit systems—both manholes and the conduits themselves—is long and unless some unusual conditions are observed in the field, the engineer will be warranted in assigning a very high percentage to the underground conduit system.

Central Office Equipment. The condition per cent of the central office condition should, of course, be based upon a careful, detailed inspection of the switchboards; central office cabling; main frames; power plant, etc. Each of the foregoing subdivisions should be conditioned separately. In inspecting the switchboards, it should be remembered that there are many replaceable parts—such as the cords—and the fact that these replaceable parts are temporarily in poor condition does not necessarily mean that the board as a whole is in poor condition. The replacement of such items as cords is cared for under the maintenance accounts, and has no real bearing upon our valuation problem.

Subscribers' Station Equipment. The condition of the subscribers' station equipment will be found to be high, except in rural communities where the instruments are not inspected at frequent intervals. It is only necessary to inspect a percentage of the subscribers' station equipment.

General and Miscellaneous Equipment. The "common sense" rule must be largely adopted in determining the condition of the general and miscellaneous equipment.

Appreciation

When appraisals are made on the reproduction cost basis it is hardly necessary to consider "appreciation" in values. The reason for this will be obvious to the reader if he will but pause to remember that reproduction cost "refers to an assumed value, based upon the estimated cost of reproducing the property new on the basis of prices current at the time of the estimate—prices that fluctuate considerably are averaged for five years preceding the date of the appraisal—and is made up to include everything that can be inventoried, **regardless of original cost, age, service, value, or present condition as affected by depreciation.**"

In other words, when we have completed a reproduction cost valuation it reflects—or should reflect—the present worth of the property "as is" at the date of appraisement. However,—as the reader will also remember—many of the State Commissions accord careful consideration to original costs in connection with their determinations of rate-base values. For this reason, it seems advisable to include a discussion of appreciation—which, of course, is the antithesis of depreciation—in the present chapter which deals with the subject of present, or depreciated, values.

Legal authorities frequently hold that if corporate property is debited for depreciation, it should be credited with appreciation—in connection with the determination of rate-base values, on the original cost basis. The courts have frequently recognized appreciation in all values—when determined by the orginal cost method—as a factor which should be included as a part of the capitalization.

In cases where property is evaluated for purposes of capitalization, or for purposes of sale—it is quite obvious that the owner is entitled to the benefit of any appreciation in values over and above the original costs. It often happens that outside factors enter into the appreciation of property values. To illustrate, improvements may have been made—in the immediate vicinity of the property under consideration—which tend to enhance property values. The growth of a town or city; the building of railroads; the development of the surrounding rural community and other similar causes may cause an appreciation in value.

In the case of Cotting vs. Kansas City Stock Yards, 82 Fed. 839, the court said:

"The owner cannot be deprived of such increments in value by legislative action which prevents him from realizing an income commensurate with the enhanced value of his property". In this particular case the court referred to enhanced property values for purposes of capitalization and sale—or for rate-making, if the values were originally determined on the original cost basis.

It is true that some Public Service Commissions have considered that appreciation should be credited to income or carried as a surplus. Eventually, in such cases (where appreciation is carried as a surplus) it goes to the stockholders in the form of dividends; stock dividends or some other form of proceeds." In the case of J. G. Mayhew vs. King's County Lighting Co.—Case No. 1273 Public Service Commission, 1st District, New York—the Opinion stated:

"In case the property is sold the purchasers would be obliged to capitalize the appreciation, so that there would seem to be no objection to doing this at any time the amount of appreciation is determined." In this case the Commission, of course, referred to the determination of values on the original cost basis.

Dr. Hammond V. Hayes, in his book "Valuation of Public Utilities", makes a very interesting statement with respect to appreciation, which is quoted without comment by the writer:

"The intent of the advocates of the plan of making appreciation offset depreciation is that, by such a plan, the annual costs of service will not be increased by the return claimed by the undertaking on the appreciated value of its property, and that what the undertaking may claim as its right to increased earnings will be offset by the reduction in the annual reserves for renewals. Any such scheme will not operate, practically, so as to attain the object of its advocates.

"The users must pay, as a portion of the charges for service, the costs of replacing items of property which become unserviceable. These reserves for renewals—usually called reserves for depreciation—necessarily increase the cost of service. If the amount paid each year by the users for reserves for renewals is reduced by the amount of appreciation in the value of the property, it would seem, at first thought, that the costs of service would be reduced."

From the foregoing, the reader will readily appreciate the importance of according careful consideration to appreciation—when values are determined by the original cost method. As previously stated, many Public Service Commissions are prone to investigate records of original cost most carefully and to give such records a good deal of consideration in determining the final rate-base values.

This concludes our discussion of the subjects of Depreciation and Appreciation. In the December issue the all important question of unit cost derivation will be discussed in detail.

TAKES PHONE CENSUS

U. S. Has 65% of World's Phones According to Latest Compilation

New York City.—The United States had 65 per cent of all the telephones in use over the world at the beginning of 1922. The total number in use in the United States on Jan. 1 was 13,891,189, or about one telephone for every eight persons. Germany ranks second with 1,809,574, or about one for every thirty-three persons. Great Britain ranks next with 986,964, or about one for every fifty persons. France had 473,212 and Sweden 389,830. Canada was ahead of the large European powers with 856,266, slightly better than an average for one to each ten persons. Japan ranks seventh with 311,000; Holland has 158,830; Switzerland, 152,336; Norway, 132,364; Argentina, 116,664; Italy, 114,977, and the balance of the compilation shows less than 100,000 telephones.

Practical Plant Problems

Chapter VIII—The Fundamental Plan—Continued

By Charles W. McKay, Associate Editor

As stated in a previous installment, the Plant Engineer should be guided largely by the ultimate requirements, in planning the conduit system—unless there is a great difference between the ultimate requirements and those for the five year period. It is thought that the reason for this will be obvious to the reader, when it is remembered that the inclusion of several additional ducts—at the time the subway is constructed—involves a relatively small additional expense, as compared with the cost of subsequently tearing up the street and enlarging a conduit system.

It should also be remembered that, in planning underground conduit systems, feeder cables should never be utilized to their full capacity. Due allowance should be made for the failure of cable pairs; for increases in the subscriber requirements and for such changes as may be necessary to provide a flexible feeder distribution system. In other words, the Plant Engineer must provide cable facilities quite a little in excess of the ultimate pair-line requirements. This phase of the subject was discussed in some detail in the October issue and safety factors (or factors of "constant efficiency", as they are sometimes known) were specified for various sizes of subway—using the 600 pair cable, 400 pair cable, and several other cable sizes, as a unit.

Forms of Conduit Construction

The phase of our present subject which has to do with actual subway construction will be treated in some detail in a subsequent portion of this series—the portion devoted to "Construction Methods." It may be well at this juncture, however, to discuss briefly the fundamental types of subway construction. Complete Concrete Envelope. A form of subway construction prevalent in the larger cities, such as New York and Chicago, is known as the "complete concrete envelope" type. Multiple duct tile, as a rule, is used and the tile itself is surrounded by an enveloping sheath of concrete. Usually, the concrete envelope is reinforced with iron tie rods —laid in the direction parallel to that of the subway. Such a subway, obviously, has great mechanical strength and this feature, in itself, is most desirable in large cities where the streets are frequently excavated—in connection with the repairs, maintenance or enlargements of electric lights, water, gas and other subsurface structures. Where the complete (reinforced) concrete envelope type of telephone subway is used the danger of injury to telephone cables—in connection with excavation work—is reduced to a minimum.

The concrete envelope is usually about three inches in thickness and, of course, surrounds the conduit on all four sides.

As a specific illustration of the benefits which may be derived from the use of the complete concrete envelope type of construction the following incident is cited: Some fifteen or twenty years ago—at the time the initial rapid transit subway was built in the Borough of Brooklyn, New York City—the telephone conduits were laid upon a concrete base not reinforced. No enveloping sheath protected the conduit system on top, or at the sides. Naturally, when the rapid transit subway was built, the entire street was torn up and the telephone conduit system did not have sufficient mechanical strength to permit it to be shored and maintained in its original position. Finally, before the work was completed, it was necessary to break the clay ducts away from the cables and to suspend the cables from the shoring used in connection with the rapid transit subway. As a net result, the cables were frequently injured; the telephone company was put to a very large maintenance expense (to say nothing of the expense involved in building a new telephone subway after the rapid transit system had been completed) and the telephone subscribers were continually annoyed by interrupted service—caused by damage to the underground cables.

A few years later the complete reinforced concrete envelope type of construction was evolved. Shortly afterwards the telephone company had an opportunity to observe the benefits resultant from this type of construction. The rapid transit subway system was extended; the reinforced concrete encased telephone conduits were found to have sufficient mechanical strength to permit of their being shored (or otherwise attached) to the rapid transit subway superstructure; the expense of this shoring was relatively small (as a matter of fact in this particular case it was borne entirely by the constructors of the rapid transit system) and there was little or no interruption to telephone service. After the transit subway had been completed it was a comparatively simple matter to find a permanent berth for the telephone conduit system.

Partial Concrete Envelope

In the smaller cities and towns—where there is less danger of injury to a telephone conduit system—a form of construction known as the "partial concrete envelope" type has been used with very satisfactory results. In this type of subway construction, also, multiple duct tile is used. The tile is laid upon a concrete slab 4 or 5 inches in thickness. This slab extends about 3 inches (on each side) beyond the end of the tile. The reason why the cross-sectional dimension of the concrete foundation slab is approximately six inches greater than the cross-sectional dimension of the telephone conduit will be obvious to the reader—no concrete lateral walls are used in this type of construction and if the dimension of the foundation slab coincided with the dimension of the conduit it would be a comparatively simple matter to displace portions of the conduit, thus throwing the subway out of alignment and probably ultimately resulting in damage to the telephone cables.

The partial concrete envelope type of construction also provides a protecting concrete slab placed on top of the conduit system. This top slab is usually about three or four inches in thickness and its longest cross-sectional dimension is slightly in excess of the cross-sectional width of the conduit itself. The top slab is placed to protect the conduit system during the process of such minor excavations as are prevalent in the smaller cities and towns. Workmen, for instance, in excavating for water, gas pipes, etc.,

will unearth the concrete slab before they come in contact with the conduit system itself—and even if their tools come in sharp contact with the slab, little or no damage will result. If the top slab were omitted, however, a sharp blow from a pick or a shovel would undoubtedly fracture the clay conduit and in all probability damage the cables.

The partial concrete type of construction is, of course, much less expensive and is recommended for ordinary usage—except in connection with the extraordinary conditions encountered in the larger cities. An illustration of the general method of construction is presented in Fig. 14 and a cross-sectional view, in Fig. 15.

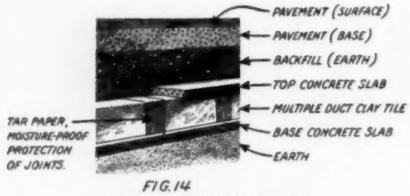

FIG. 14
ILLUSTRATING PARTIAL CONCRETE TYPE OF SUBWAY CONSTRUCTION.

Fiber Conduit (Embedded in Concrete). Another type of construction that has a great advantage from the standpoint of durability and maximum mechanical strength is obtained by laying fiber conduit ducts in a bed of concrete. Telephone subway of this type is very expensive—from the standpoint of first cost—and is not recommended for ordinary usage.

Manholes

It is especially important that the Plant Engineer should include, in his fundamental plan, provision for manholes at frequent intervals. The manholes should be placed from 300 to 500 feet apart—the exact spacing being dependent upon the individual peculiarities of the specific problem under consideration. One factor which has a great deal to do with the spacing of telephone manholes is the dimensions of the city blocks. Other things being equal, it is, of course, desirable to have the manholes located at street (or street and alley) intersections. Another guiding factor which must be clearly borne in mind by the Plant Engineer is that the manholes must be placed close enough together to obviate excessive mechanical strains on the underground cables —at the time they are installed.

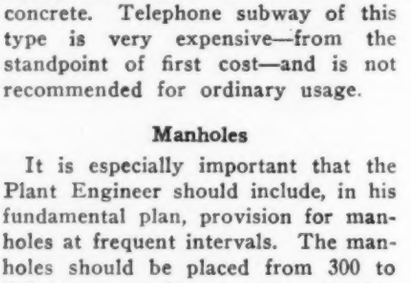

FIG. 15
CROSS-SECTIONAL VIEW OF PARTIAL CONCRETE TYPE OF CONSTRUCTION.

Sizes of Manholes

Naturally. the size of the manhole is largely dependent upon the number of ducts in the conduit system. It is difficult to specify hard and fast rules for determining manhole sizes, —but the following suggestions are offered, based upon the practice of one of the larger telephone companies.

In cases where the cables run straight through the manholes—in other words, where there are no branch or intersecting subways—the inside manhole dimensions specified in Fig. 16 may be used.

It frequently happens that branch conduit systems enter, or leave, a manhole and in such instances the dimensions given in Fig. 17 are suggested.

Fig. 16. Inside Manhole Dimensions for Straight Runs

No. of Ducts	Length	Width	Height
1 to 6	4 ft. 6 in.	3 ft. 6 in.	4 ft. 6 in.
7 to 15	6 ft.	4 ft.	5 ft.
16 to 24	8 ft.	5 ft.	5 ft. 6 in.

Fig. 17. Inside Manhole Dimensions for Branch Manhole

No. of Ducts	Length	Width	Height
1 to 6	4 ft. 6 in.	4 ft. 6 in.	4 ft. 6 in.
7 to 15	6 ft.	5 ft.	5 ft.
16 to 24	8 ft.	5 ft. 6 in.	6 ft.

Shape of Manholes

There are four standard types of manhole construction,—the square (or oblong) manhole; the hexagonal (or six-sided) manhole; the octagonal (or eight-sided) manhole and the elliptical manhole. Sectional views of these various types of manhole are presented in Figs. 18 to 21 inclusive. Usage of the square manhole is, perhaps, becoming almost obsolete—due to the fact that the cables cannot be racked upon the manhole walls readily, without bending or "kinking" them. The elliptical manhole, as illustrated in Fig. 21 has been used almost exclusively by one of the large Western Companies—and it is claimed that the results are most satisfactory.

This completes the discussion from an engineering standpoint, of the conduit systems and manholes. In the December installment, engineering phase of cable splicing problem will be discussed.

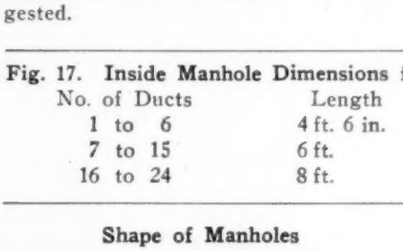

FIG. 18
SECTIONAL VIEW OF SQUARE (OR OBLONG) MANHOLE

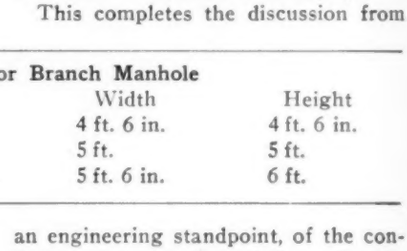

FIG. 20
SECTIONAL VIEW OF OCTAGONAL MANHOLE

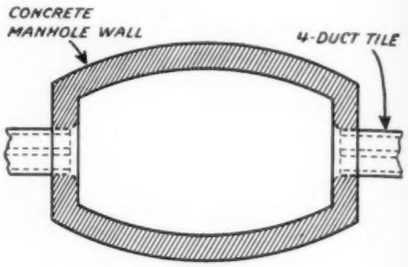

FIG. 21
SECTIONAL VIEW OF ELIPTICAL MANHOLE

Visions Tomorrow's Company

"Looking Forward," An Illinois Convention Address, Tells Commercial Expert's Idea f Millennium— Already Signs of Its Approach May Be Discerned

By A. R. Bone

General Commercial Superintendent Illinois Bell Telephone Co.

Well do I remember my first job in the telephone business, when I was a lad of thirteen, as night operator in my father's exchange. While attending school I successively devoted my spare time and vacation time to learning various phases of the business as it was then conducted, such as the ground-man's job or the grunt's job, line work, repairman's mulitudinous duties, installing, collecting, soliciting new business, and hardest of all, in that day, the job of trying to make the subscribers believe the service was worth anything at all, or if they did think it was, to get them to admit it. Even with the trials and tribulations, those were happy days. The love engendered in me for the business and the friendships made with others in the game during those early years are experiences which I am glad I have had.

By reflecting on the past we can successfuly plan for the future so that our achievements may be better and bigger and broader. We may, if our reflections in respect to the things of the past are directed along proper lines, permit ourselves with profit and pleasure to dream dreams and see visions of the future.

I look forward to the time when all the telephone companies in the state will feel free to always be frank in their dealings with one another, have confidence in one another and work together in a spirit of co-operation and harmony, friendliness and helpfulness; in that spirit of one-for-all and all-for-one, which will rebound to the credit of the business as a whole and be of benefit to all the individuals engaged in furnishing telephone service, and thereby be reflected in the service rendered to the public.

In looking forward I have a vision of the time when every telephone man and woman will be so much in love with the work they are doing that they will be sorry to see the day's work draw to a close and delighted with the prospect each day of beginning another day of service to the public and to their fellow-men.

Satisfactory public relations, synonymous with a good name, are rather to be chosen than great riches. I look forward to the time when every transaction with the public by an employee will be so well handled that the customer will in no case ever have cause for believing that any other motive guides our actions than that inspired by a desire to serve well in all little things as well as in big ones, and feel that the employee is really and truly a friend. I also look forward to the time when each individual employee, with our friends the Rotarians, will implicitly believe in that adage, "He profits most who serves best."

A Fair Deal from the Press

I also look forward to the time when no newspaper, because of the heat of a political campaign, or for any other reason, will ever see fit to take an undeserved fall out of us in order that someone may have an issue on which to conduct a campaign or to be used for some selfish motive; but rather that we shall always merit and always receive commendation for acts and services well performed. A well-conducted telephone utility expects and is entitled to fair treatment from the newspapers.

I look forward to the time when every telephone subscriber will be a stockholder in the company which serves him. It is my belief that the telephone companies of Illinois possess, in a large measure, the goodwill and support of the people of this state. This confidence and co-operation has been built up and strengthened through years of close business relations, fair dealing and frankness. It is a tremendous asset. As Mr. E. K. Hall, Vice-President of the American Telephone & Telegraph Company, has so well said, the four "C's"—"Contact, Courtesy, Co-operation and Confidence"—are the essential qualities necessary for satisfactory public relations, so also are they necessary if we are to interest our subscribers in the direction of having them become stockholders.

The success of the telephone utility depends upon the measure of goodwill of the community which it can get and hold. We must give the best and broadest service possible. We must provide a service which will not only keep pace with the growth of the state, but also with the constantly increasing use of the telephone. We must make our charges low enough to enable every person who ought to have a telephone, to have one, and at the same time we must earn enough to attract capital to take care of this growth. To earn more than is necessary to maintain and extend the service, would evidence poor judgment and in the end would be bad business for our stockholders; to earn less would be an injury to the public. There must be no waste. The best brains we have must be applied increasingly to effect economies in construction, maintenance and operation. We must struggle unceasingly for better service and lower rates, but in the interest of the public, as well as of our stockholders, we must resist every misconceived attempt to decrease rates to a point which would make it impossible for the telephone utility to keep up and give the best service anyone knows how to give. We cannot have fat years and we must not have lean years.

If these statements are true, and I believe all of you will agree with me that they are, it seems to me that it would not be difficult for any of us to get our patrons to become financially interested in the business. If we do get them represented in large numbers in this manner, then we also get their support in thwarting misconceived attempts on the part of anyone to decrease rates to a point which would make it impossible for us to keep up and give the best service anyone knows how to give.

I cannot refrain from saying that I look forward to the time when there will be one-hundred per cent co-operation between all parties to a telephone call, viz.: the person calling, the telephone company and the person called.

Speaking of co-operation reminds me of a little story:

A farmer was one day driving a team of horses attached to a cultivator, and a stranger stopped to look on. "Your horses work well together," said the stranger. "Yes," replied the farmer, "one is willing to do all the work, and the other is willing to let him."

This is a sample of negative co-operation which is not infrequently seen where others are struggling to make the positive or real co-operation a success.

Educating the User

The telephone companies are constantly making improvements in practices and methods, and errors for which they are responsible have been reduced to a minimum, but there is much evidence to indicate that enough educational work has not been done by the companies in the direction of educating their patrons in respect to the best methods they should use in order to obtain a maximum of efficiency, benefit and satisfaction from the use of the service.

I look forward to the time when we may expect one visit a year in person from every telephone subscriber to the telephone exchange which serves him, so that he may see the various interesting features the chief operator will point out to him; learn more about how the operators handle the calls and how the apparatus works and why it works as it does and ask questions that will put him in a position to receive the best possible results in connection with his service.

Each day we take visitors through our exchanges. Last week we took a friend through our "Main" operating room. He was the average type of wideawake, intelligent business man, who uses his telephones, office and residence, scores of times every day, and yet the world behind the little instrument had always been a sealed book to him.

Here's the Reaction

Was he interested? That's not the word at all. Here's what he wrote to the man who showed him around:

"My dear Sir:

"I want to thank you for the illuminating experience I had in watching your telephone system as it operates in the "Main" operating room.

"It made me feel very small to see that trained army of quick, silent experts at work—making it possible for countless thousands to multiply their individual power many times by instant personal speech with many people—some of them in very remote places—many times a day.

"It gave me a wholly new feeling of obligation to the organized intelligence that has made this strange and wonderful power instantly available. No miracle in the Bible seems greater to me than to hear the voice that answers mine, out of seemingly limitless space—like the voice that spoke to Moses from the burning bush.

"And to think that I have sometimes criticised the telephone service. It seems to me now almost blasphemy.

"Whatever else I may have to cut down on, the telephone will always be worth to me all and more than it costs. My experience in your operating room has opened my eyes."

That's it; it opened his eyes. It always does. We never knew it to fail.

The fact is, we telephone people need to have our eyes opened to the wonderful business we are in. When we realize that, we will never be satisfied until the great body of the public we serve realizes it, too, and appreciates at its true worth the value of telephone service.

OPERATOR RULES TERRE HAUTE.

"Queen Mayme", Chief Operator, Pageant Monarch—Engineer Also Registers.

Terre Haute, Ind.—All hail Queen Mayme, the reigning beauty of Terre Haute's first "Pageant of Progress"!

"Queen Mayme" after her regal garments have been doffed and her crown exchanged for a headset, is Mrs.

MRS. MAYME GFROERER

Mayme Trierweiler Gfroerer, chief operator for the Citizens Independent Telephone Co. She was an easy winner in the popularity contest, open to all citizens of Terre Haute.

The telephone company also figured in another prominent aspect of the "Pageant of Progress", the poster which advertised the affair extensively having been designed by Bert Reibel of the company's engineering department.

"Faraday," Veteran Cable Ship, To be Replaced

London, Eng. After nearly half a century's arduous work in connection with the laying and repairing of submarine cables in all parts of the world, the well-known cable ship "Faraday" of Siemens Brothers & Co., Ltd., Woolwich, England, is shortly to be replaced by a new cable laying steamer. Although still capable of performing her duties in a trustworthy and creditable manner, the good old vessel was gradually becoming obsolete in various ways, and in order to meet the anticipated increase in cable laying during the coming years, the Company decided to build a new ship designed on the most modern lines and complete in every respect. The new vessel, which will be ready for work early next year, will be of steel, 380 feet long, 48 feet wide. Sufficient oil fuel can be carried to give a steaming range of about 10,000 miles. There will be four cable tanks capable of carrying approximately 4,350 tons of cable.

The "Faraday" laid some 50,000 miles of submarine cable in all parts of the world, including 8 submarine cables across the Atlantic. She has also been employed for carrying out many repairs to Atlantic cables in deep water up to depths of 3,000 fathoms.

Telephone Men on the Hospital List

A. L. Stadermann, Chief Engineer of the Citizens Telephone Co., Terre Haute, Ind., visited the Chicago Convention on his way to Rochester, Minn., for an operation at the Drs. Mayo hospital.

Jack Coffey missed the Chicago meeting for the first time in many years being at the time in Pittsburgh, Pa., for a rather serious operation. His wife also was reported very ill, while her sister had just died.

Hart Anderson, Page & Hill's good pole salesman and publicity artist, had to skip the Chicago convention while surgeons were carving out his appendix.

Emperor Charles Took the Count by Telephone from His Palace

Vienna, Austria.—In the recently published memoirs of Prince Ludwig Windischgratz the use of a telephone by an emperor abdicating his throne was chronicled for the first time in history. Charles telephoned from Vienna to Budapest to acknowledge he was through.

Ask Substation Protection Aid

Independents Lax in Co-operating With Insurance Interests for Reduction of Fire Hazard, Says Speaker at Independent Convention—Presents Regulations

By William S. Boyd

The fire insurance companies have long realized that they are not able to cope with the ever-rising tide of the fire waste. Many years ago its representatives organized the National Fire Protection Association with a view of directing attention to the extent of the fire waste and presenting plans and specifications, which, if followed, would tend to reduce this needless and criminal destruction of life and property.

At first its membership was confined quite largely to fire insurance and allied interests, but gradually business men in general awakened to the danger which threatened and still threatens our financial stability and the ranks of the organization have been swelled by these able administrators of the country's economic affairs. Many women of prominence have also become associated with the movement.

The fire loss figures do not seem to indicate that anything like success has perched upon the banners of this gallant host but the fight is still on and by dint of much sapping and the bombardment by heavy artillery the citadel of the enemy—carelessness—is being approached and the observers in "no man's land" are bringing in to headquarters information which will eventually enable the attacking forces to bring about the unconditional surrender of the fire fiend.

Helping the Electrical Committee

One of the activities of the great volunteer army includes the regulation of the electrical hazard through the operation of its electrical committee. This committee at one time was almost exclusively composed of insurance men but the far-reaching effect of its rules upon the electrical industry compelled the committee to seek and secure the co-operation of the leaders of the industry, and the wisdom of the move has been abundantly demonstrated.

Electrical Committee's Work

This committee has become quite large and its work is now done to a great extent by standing committees to which the work of the electrical committee is apportioned and to which committee these committees report.

To facilitate its work, each standing committee may appoint one or more technical sub-committees to consider and report upon a certain subject or rule. The report of the technical subcommittee goes to the standing committee which appointed it and, after careful review, is then presented to the electrical committee for final action before publication in the electrical committee bulletin.

The bulletin is published and circulated to the industry some months before the date set for the customary public hearing which precedes the adoption of revisions of the Code and at which all of the reports bulletined by the electrical committee are presented for criticism on the part of those interested. Later the electrical committe considers the reports in the light of information gained at the public hearing and the rules are amended accordingly.

The amount of labor performed by these committees is prodigious and should be participated in by all branches of the electrical industry, in order that the burden may be as generally and equally distributed as possible.

Independents Don't Co-operate

In this work we have always had the active co-operation of the representatives of the so-called Bell companies and the signaling rules which relate to the safe-guarding of the telephone, represent, to a large extent, views acceptable to that organization.

I am sorry to say that we have not had the active co-operation of the so-called Independent telephone companies in the preparation of these rules, although an invitation was extended to one of your members to act with the committee on signaling systems of which I was chairman. I could hear nothing from him and the fact that none of my letters was returned leads me to believe that they were delivered and ignored, or the party was too busy to do any committee work.

So if the signal rules do not please you, it is probably the fault of one of your members.

I am grateful to report, however, that in the case of the technical sub-committee on proposed national electrical code rule 86 which relates to radio apparatus, President MacKinnon accepted our invitation to you to be represented and W. L. Cook has acted for you in this work. For this co-operation we are grateful.

In connection with the enforcement of National Electrical Code rule 85 which relates to telephone, telegraph and similar systems, we have had the wholehearted co-operation of the Bell companies, but I regret to say a less enthusiastic support from the Independent companies. Recent reports indicate that this lack of interest on your part in standard of approved protection is changing for the better and I am grateful for it.

Let us now turn to the consideration of the main subject—"Substation Protection." Protectors are not required under the following conditions (I quote from Rule 85 of the National Electrical Code):

"When the entire circuit is run in underground conduit from the central station to the block in which the building is located, provided the circuit within the block is so placed as to be free from chance of accidental contact with electric light and power wires of over 250 volts.

Substation Protection

"Under all other circumstances the rules require that telephone wires entering buildings and connected with telephone substation must be provided with an approved protective device located as near as possible to the entrance of wires to building. The protector must not be placed in the immediate vicinity of easily-ignited stuff, or where exposed to inflammable gases or dust or flyings of combustible materials.

"The ground wire of the protective device shall be run in accordance with the following requirements:

"1. Shall be of copper and not smaller than No. 18 B. & S. gage and, where exposed to mechanical injury, must be protected.

"2. Must have a rubber insulation of not less than 1/32 of an inch in thickness and covered by a substantial braid.

"3. Must run in as straight a line as possible to a good permanent ground. This may be obtained by connecting to a water or gas pipe connected to the street mains or to a ground rod or pipe driven in permanently damp earth. When connections are made to pipes, preference shall be given to water pipes. If attachment is made to gas pipe, the connection in all cases must be made between the meter and the street mains. In every case the connection shall be made as near as possible to the earth.

"When the ground wire is attached to a water pipe or a gas pipe, it may be connected by means of an approved ground clamp fastened to a thoroughly clean portion of said pipe, or the pipe shall be thoroughly cleaned and tinned with rosin flux solder, and the ground wire shall then be wrapped tightly around the pipe and thoroughly soldered to it.

"When the ground wire is attached to a ground rod driven into the earth, the ground wire shall be soldered to the rod in a similar manner.

"Steam or hot water pipes must not be used for a protector ground.

"The protector to be approved must comply with the following requirements:

"1. Shall be mounted on non-combustible, non-absorptive insulating bases, so designed that when protector is in place all parts which may be alive will be thoroughly insulated from the surface on which the protector is mounted.

"2. Shall have the following parts: An arrester between each line wire and ground. A fuse in each line wire.

"3. The fuses shall be so placed as to protect the arresters. The protector terminals shall be so marked as to indicate clearly the 'line,' 'instrument' and 'ground terminals.'"

Obviously the lightning arrester mounted on a wood base at the substation does not comply with these rules. The practice of locating an arrester of this type at the substation should be abandoned and all reliance placed upon an approved protector located at the service entrance. Wood base arresters have caused fires; therefore, we object to them.

If these rules do not represent correct practice, it is not due to lack of effort on the part of the electrical committee to obtain your views.

I want to make it quite clear that I am not assuming that the substation protection of all Independent telephone systems is substandard because I know that such is not the case, but many of your company members are still in the market for telephone instruments equipped with wood base lightning arresters. This practice should be carefully investigated by you and if found undesirable, it should be condemned, abandoned and standard protection substituted.

Telephone Engineers Eliminate Many Fire Hazards

At this point I wish to bear witness to the very able manner in which telephone engineers have solved practically all telephone fire hazard problems without interfering with the service.

In the old days when bare telephone drops were used in conjunction with the magneto ringers, every windstorm in Chicago brought forth a crop of from 20 to 30 fires in telephone instruments due to broken telephone drops falling on unprotected trolley wires.

We first tried to force the street railway companies to string guard wires above the trolleys, and in many cases this was done, but the guard wires were not well maintained and were damaged by trolley poles when they slipped off the trolley wire. It soon became apparent that no reliance could be placed upon these guards as most of them were in contact with the trolley wires at one or more points within a few weeks after installation, so the telephone companies soon adopted the insulated drop where trolley wires were concerned. A further improvement was effected when the central energy system was adopted and perfected, eliminating the magneto ringer.

While the magneto ringers were in service, the so-called "sneak current coil" had to be used on the protector, and the eccentricities of this coil produced much agony for the troubleman. The first fuses used were quite small, and many fuse bases carrying them were blown to pieces when telephone wires came into contact with high voltage wires.

High grade telephone engineering, improved line construction and approved protectors have combined to make the telephone the family guardian, to which it instinctively turns when danger of any sort makes its appearance. This well-earned reputation has been acquired at great expense and much suffering in living down a questionable past, involving many fires and fatalities, including the destruction of not a few exchanges.

Independent Companies Slow to Appreciate Standard Protector

A few years ago municipal ispectors reported that they could secure compliance with code rules governing telephone installations on the part of every one except the Independent companies who usually told the inspector that they protected their subscribers in some other way.

This cost one company several thousand dollars when a fire, which started in its service drop, badly damaged a frame dwelling. The plaintiff in the case was able to prove that no protectors were installed in the building damaged but that all kinds of protection was provided for safeguarding the exchange.

Association Companies Probably Free From Criticism

The fact that you have formed yourselves into an association for study, conference and, perhaps, standardization, leads me to express the hope and confidence that your member companies are not the ones that were criticized by our inspector friends but are those which realize the need for adopting the best and safest practice in telephony.

In closing, may I again say to you in all seriousness that we desire your co-operation in prescribing rules for regulating telephone and other signal apparatus and, if our rules do not meet with your approval, it is because we have somehow failed in our efforts to enlist your aid in this work.

PURDUE PHONE SCHOOL

Telephone Short Course at Purdue University Nov. 13-Dec. 8

Lafayette, Ind.—The fourth annual Telephone Short Course will be held at Purdue University from Nov. 13 to Dec. 8 under auspices of the Engineering Extension Department.

Work offered the telephone men of the State is entirely practical, and the program has been so planned that the visitor may take the particular part which interests him without staying through the entire time of the course.

The work has been divided into four sections, one week being devoted to each section. The program is as follows:

First week, "The Substation Instrument"; second week, "Switchboards and Switchboard Circuits"; third week, "Cable Work, Splicing and Wiping"; fourth week, "Testing and Trouble Location."

No charge is made for the course. The only expenses are traveling, board and lodging, and personal.

A pocket set of tools should be brought, and those desiring to do so may also bring Wheastone Budges or any similar apparatus for testing.

For further details address Professor R. V. Achatz, Department of Electrical Engineering, Purdue University, Lafayette, Ind.

THE INDEPENDENT PIONEERS' LUNCH AND VAUDEVILLE HAD A "CAPACITY HOUSE"

Profit Ideas Abound At Exhibits

Chicago, Ill.—Exhibits at this year's convention gave evidence of being carefully planned for their educational value to the convention visitors.

The number of demonstrations that were being conducted gave ample opportunities for studying the equipment's operation in service.

In the October issue of TELEPHONE ENGINEER details of many of the exhibits were given in advance, among those described being the convention showings of the American Appraisal Co., Monarch Telephone Mfg. Co., Paul W. Herbst, Acme Card System, Kellogg, Stromberg-Carlson, Leich, Chance Co., Runzel Lenz and Harrah Mfg. Co.

Among the devices which were shown to telephone men for the first time was the Brookins Blow Torch. This blow torch was demonstrated in several novel ways. It was shown that it would burn in any position and would burn in a gale. The demonstrator swung the torch around his head and its flame continued steadily. Pumping and filling from the top center, intense heat, which was demonstrated by melting brass, light weight and operation on generated gas were other features which aroused the buying interest of telephone men.

The Telometer, which was exhibited in Kellogg's impressive display, attracted considerable interest and indicated the growing attention in measured service.

French Battery had an exhibit with the sure enough punch. A full line of telephone dry cells, among them being featured the new long-life, shelf-proof battery, was shown, together with the companies radio batteries. French did a big business at the convention. Operating at the French display were J. C. Ford, sec., Frank Eldridge, Frank Foster, C. C. Waddel, J. Hayden, Fisher Brown and George A. Shipley.

Page and Hill staged a strictly educational exhibit. The purpose of this, according to Louis Hill, was to inform the telephone man of what he has a right to expect and what to look out for in telephone poles. Many interesting phases of pole preservation were shown by exhibits. The floor of the exhibit was covered with cedar boughs. Sections of Page and Hill poles were displayed and caused the observing young son of George Metheny, the Lima, O., telephone man, to remark that the pole sections looked like slices of ham.

In Jack Coffey's absence, W. J. Marold cared for the interests of the Coffey accounting system.

Runzel-Lenz booked good business at the convention and found that prospects indicated a record-breaking 1923 figure on the order books. Premier B. B. cords got an especially strong play. Other R-L cords for telephones and switchboards, and cables, were shown.

Kellogg had enough men on the job to make a fair sized convention of their own. Representing the executive staff were: J. B. Edwards, president and general manager; J. G. Kellogg, vice-president; L. D. Kellogg, vice-president; S. Guthrie, secretary and treasurer; Edw. I. Pratt, advertising manager; H. D. Currier, chief engineer; G. D. Wolf, general sales manager; Chas. Sparks, asistant general manager; E. F. Potter, radio department; C. D. Woods, R. Siemund, M. A. Bellion, J. F. Tompkins, C. P. Camp, D. J. Gillespie, C. A. Larsson, E. L. Morton, S. A. Mounteer, C. W. Nelson, J. F. McCabe, C. H. Reese, C. Ruge, R. W. Glaser, H. P. Schmidt and J. Geiger.

Kellogg's salesmen on hand included Glanton Smith, D. B. White, J. A. Stratton, C. F. Fairly, J. W. Walton, H. A. White, H. N. Faris, H. W. Hogue, H. B. Dudley, J. W. Blaylock, L. F. Kline, D. E. McGregor, W. R. Kimmel, W. S. Boze, R. H Coyne, S. W. Holmes, M. H. Croswell, G. L. Banks, W. S. Fisher, C. M. Thompson, B. Woodbury, B. A. Ogden, W. F. Murray, E. N. Ridley, F. Seeley and J. R. Shipley.

Kellogg's most complete convention exhibit was made at Chicago.

PIONEERS MEET

Judging from the tempo of the Pioneers' party at Chicago, the early birds are just striking their stride notwithstanding their long activities in the telephone industry.

The noon luncheon was packed to the guards and overflow sessions were held in adjoining dining rooms.

A very nifty job of press agenting done by the committee in charge was responsible for the widespread interest in the luncheon.

Big time vaudeville talent headed by Walter Kelley, "The Virginia Judge" kept the diners merry until well into the afternoon.

To head the Pioneers for the ensuing twelve month, H. E. Bradley of Harrisburg, Pa., was chosen. J. K. Johnston will fill the job of secretary-treasurer. The executive committee for the coming year consists of H. E. Bradley, Harrisburg, Pa.; G. W. Robinson, Minneapolis, Minn.; Walter Uhl, Logansport, Ind.; H. L. Beyer, Grinnell, Iowa; W. S. Vivian, Chicago; Frank A. Knapp, Bellevue, Ohio; F. W. Twyman, Charlottesville, Va.; John Z. Miller, Erie, Pa.; and J. K. Johnston, Indianapolis, Ind.

The Pioneers received 64 applications for membership at the convention.

The biggest feature of the display being the demonstration of the Kellogg service and universal boards. The service board was a four-position unit type, with all of the well known service features. The special advantages of this board are unusually efficient service with economical operation, low initial cost and maintenance charges; reduction of operating force by about one-half; and that operators working on it find they have no difficulty in answering 400 calls or better per hour, says the Kellogg company.

The Kellogg universal type switchboard demonstrated excellent common battery and magneto service over the same board by means of universal cord circuits which allow magneto to magneto, magneto to comon battery, and common battery to common battery connections. By changing the connection on the relays, it is said a company can change over one line at a time from magneto to common battery on the universal board, without the purchase of additional equipment. The universal board giving common battery service can be made into a service board, using the same cabinet and practically all of the same equipment. This board, it is stated, is of special benefit to companies which are planning to cut over to common battery at a date subsequent to the purchasing of a board.

In the Kellogg exhibit also was the new 140 universal board, the same size as the 150-type magneto switchboard. This board makes it possible for the small magneto company, while maintaining the magneto service, to give common battery service to those subscribers who desire it. The exhibits included, in addition, a 150-type magneto and a 50-line P.B.X. switchboard.

The regular display of the latest magneto and common battery telephones with the miscellaneous apparatus, Kellogg Bakelite products, Kellogg telephones, equipped with Kellogg automatic dials, and a complete line of radio apparatus and parts, also was shown.

At the North exhibit was a girl who ought to be an able hand at any cut-over. She was Miss Joy Chenowith, one of the operators at the Mayo Brothers' famous hospital at Rochester, Minn. She demonstrated North switching to many interested audiences.

Naugle was ably represented at the convention by A. J. Naugle, W. G. Frostenson, H. W. Mitchell and A. A. Marrs. Illustrations of treated and untreated poles and details of Naugle's facilities for prompt supply of telephone poles resulted in business for this active factor in the pole industry.

Headed by W. R. McCanne, treasurer and general manager, the Stromberg-Carlson staff marched on Chicago for a very successful conquest. Besides Mr. McCanne, the S-C force at their big display consisted of W. M. Angle, secretary; G. A. Scoville, sales manager; E. A. Reinke, assistant sales manager; R. H. Manson, chief engineer; W. T. Eastwood, advertising manager; S. A. Beyland, general superintendent; A. J. Roberts, manager of the Kansas City branch; C. W. Schafer, manager of the Chicago branch; N. W. Baldwin, manager of the Toronto branch; E. A. Hanover, purchasing agent; J. C. Snyder, sales engineer; J. H. Levis, assistant chief engineer; and the following salesmen: J. T. Barrett, A. B. Crawford, P. D. Myers, A. M. Roberts, Rube Davis, C. D. Kinne, J. A. Berger, C. F. Sanders, J. A. Taggert, E. D. York, A. B. Preble, Price Winemiller, W. C. Caldwell, C. W. Pointon, M. W. Redmond, G. L. Ferguson, J. P. Galligan, G. E. Adair, G. H. Crandall, B. H. Merriman, M. D. Wood, Bernie Richardson, J. D. Kratz, C. A. Sweet, J. E. Wilkins.

Standard Underground supplied parking space for its many customers and friends and displayed some samples of that company's cables and wires. A. A. Anderson, Pittsburgh, manager, E. H. Shutt, Kansas City and W. M. Rogers of Chicago were in attendance.

The new Columbia metal case "Hot Shot" battery was shown to a telephone convention for the first time at the National Carbon display. Gray Label batteries also were much in evidence, as was the National Carbon's line of radio batteries. An ingenious, though crude, telephone made by a veteran Kansas telephone man so he would not be robbed of his testing phone on account of the demands of a growing exchange, was shown in operation. A junk pile was raised for discarded telephone parts, and these, combined with coffee cans, a packing case, rope and some spikes made a telephone that stands without a peer for grotesque appearance. In attendance were M. I. Cotabish, E. A. Lanterman, Cooper W. Wilkins, who simply boiled over with enthusiasm at the convention, F. K. Kysela, R. R. Brooks, C. R. Howell, J. F. Harper and C. A. Gillingham.

The exhibit of the American Electric Co. included some interesting equipment, particularly a number of new designs in telephone instruments —both wall and desk models. Among these was a cleverly designed wall telephone—the No. X69. This instrument has several exclusive features in its construction, the entire ringer, including the gongs, being placed inside the cabinet, making this particularly safe from tampering or damage. The "Dialaphone" system of intercommunication was shown in actual operation. This is an effective yet simple intercommunicating system. Calling of the different telephones is accomplished through use of a selective dial. The mechanism of these instruments as furnished in both wall and desk type is distinguished by simplicity and accuracy of operation and construction. In addition to other standard magneto and common battery desk 'phones which have been on the market for quite a number of years, the American Electric Co. showed an ingeniously designed automatic desk stand. A full line of switchboards, protection equipment, testing apparatus, etc. complete this exhibit.

New improvements in the Turner blow torches were shown at the convention exhibit. Several patented features were emphasized, among them being the one tank opening, a safety valve which prevents leaks and explosions, an air release and a burner baffle which is said to assure high temperature, fuel economy and freedom from clogged burners.

A battery in which two zinc strips are serpentined on each side of the carbon, exposing the entire electrolyte to action, was shown at the convention by the Twin Cell Dry Battery Co. The makers claim that this battery is waterproof.

C. W. McLeod, of the McLeod Electrical Supply Co., was on deck again with his bronze drop wire, Cameron rings, Atlas torches and other supplies. Mac showed a vest-pocket radio receiving set which has a radius of thirty to sixty miles. It is the smallet radio set made, and Mac uses it in his own home, as proof of its value. A Multilistener with facilities for eight people also was a feature of the exhibit.

Monarch's nifty little idea of labeling the boards on display with the names of their purchasers had the calculated effect. Others fell in line for Monarch boards at the convention, according to the company's representatives.

That price is no object when the stuff is right was proved by the Leich steel cabinet type ringing machines displayed at the convention. Increased price was more than offset by added desirability so the order book was in evidence.

One of the outstanding features of Automatic Electric Company's display this year was the exhibit of its new Type 21 common battery telephones, placed before the telephone field for the first time.

This is the first time in more than eight years that any series of common battery telephones has been completely redesigned in every particular, says Automatic, and accordingly great interest was displayed in them.

One set of telephones was attractively framed and set in a display box. Several other sets were placed around the room and were available for inspection by visiting operating men and engineers. Still another set was dismantled so that the construction and design of any part could be seen at a glance.

The display of Stowger Automatic central office equipment was more extensive than that of previous years and more conveniently arranged.

This display included a ten line Community Automatic Exchange exhibit, using push button type automatic telephones and showing how local and toll connection are made in small unattended country exchanges.

The city exchange exhibit was arranged to show how the various kinds of service are given in an automatic exchange. It consisted of two telephones (calling and called); two sets of line switches, plunger primary with rotary secondary, and rotary primary alone (either of which sets could be cut in by a switching key); a selector and connectors for straight line, P. B. X. and harmonic party line and code rural line service.

The non-working apparatus included several individual switches on stands, a "shelf" of twenty selectors, and a complete fifty line C. A. X. unit including power board and switches.

Another live feature was the exhibit of Automatic Electric Radio head sets for receiver and loud-speaker work.

Both the Sales and Engineering Department were well represented at all times. Mr. H. A. Harris, Vice President and General Manager, and Mr. E. C. Blomeyer, Vice-President, were active in greeting old friends and making new ones. The Sales Department was also represented by Messrs. W. S. Vivian, Department of Public Relations, R. H. Burfeind and Roy Owens, M. A. X. Sales, J. H. Finley, Merchandise Sales Manager, and L. A. DeBerard and G. S. Pritchard, Radio Dept. For engineering and operating work the following were present:

Messrs. T. G. Martin, Chief Engineer; T. L. Baer, Ass't Chief Engr.; H. P. Mahoney, Supt. of Installation and Operation and James Engh, Operating Dept.

The Reliable Electric Co. occupied the same space as last year on the main corridor near the entrance to the convention hall. Even if there had been no exhibit, almost everybody in the telephone business would come in to say "hello" to George Rodormer. However, George always sticks so close to the exhibit that it's hard for anybody to even say hello to him without looking over the Reliable line.

The display included a big variety of self-cleaning sawtooth telephone protectors and cable terminals which have come into such general use. The rapid growth of the Reliable company from its small beginning to the occupancy of its fine busy factory building on Carroll Avenue is attributed by Wallace Cook, President, to substantial design and good workmanship.

The self-cleaning lightning arresters are available in such a variety of forms that the operating company can obtain the benefits without changing fuse standards. The unique phosphor bronze fuse clips insure good contact and the Reliable policy of admitting that the customer is right when questions are up for adjustment, are other factors in the company's growth says Mr. Cook.

The Bowdle Accounting System was exhibited by the designer, F. A. Bowdle, of Cerro Gordo, Ill. More than fifty accounting forms covering every phase of the telephone business were shown. Some of the most popular forms shown were a simplified Subscribers Ledger or Lease Record, a Distribution Journal which carries all distributions of invoice and vouchers as well as the general accounts. Other labor saving forms, such as time sheets for male and female employees, material record forms, invoice registers, toll records of all kinds, etc. Many additions have been made to the list of those who are availing themselves of the Bowdle Monthly Audit plan whereby they receive monthly, a financial statement of their company's business affairs. This service includes their annual report of nearly every nature.

Electric Storage Battery Company's exhibit of Exide telephone and radio batteries and batteries for other communication work was a popular feature of the convention.

Harrah Mfg. Co. presented a demonstration of the Harrah Handyman for straightening leaning poles and stretching guy and messenger wide.

Artistic honors for convention display went to the Cook Electric Company's stage setting wherein Cook pole cable terminals, lightning and substation arresters and electric soldering equipment was attractively displayed. At the Cook exhibit were G. R. Folds, President, J. F. Jaap, Chester Ruth, D. C. McKee, J. A. M. Wilkins and J. C. Bogle.

Chance Never-Creep anchors hooked into a good lot of business at the convention. With A. B. Chance, A. B. Chance, Jr., and J. J. Milligan on the job the merits of the popular anchor were brought to the attention of the many delegates. Chance protectors and linemen's socket wrench also were pushed strong.

Paul W. Herbst's organization with the boss himself and V. A. Echdahl, Tom Lawrenceson and George Hiser, brought before the telephone field for the first time the Silvey conduit bender, or hickey, which was greeted by the close interest of many telephone men. Among the other products featured by the Herbst men were Rimco insulated pliers, Klien's tools, Barthel torches, Vaughan and Bushnell's tools, National cable hangers and Rieman folding steel horses.

"Happy Jack" Crawford, the perennial Pollyanna, had Everstick and Blackburn anchors under the big tent, and featured the new tamping bar which fits around the rod, assuring a perfect spread. Jack also shoved the Blackburn boltless clamp, Neverslip cable hangers and the Davis lineman's chair into the limelight.

J. K. Johnston made an unusually interesting display of his appraisal work, and in the infrequent breathing spells allowed him by the press of Pioneer society duties, talked business with some candidates for his service to good advantage.

W. C. Meader, of the Bell Lumber Co., explained to many visitors the merits of Bell northern white cedar and western red cedar poles. Bell's butt-treatment to any specifications was described, and samples and photographs illustrating the company's resources, its methods and its products, were displayed.

The first telephone property ever insured with Lynton T. Block and Co. has renewed every year, said W. S. Ferguson, who, with W. D. Jackson, was in attendance at the Block exhibit. Ferguson, without whom no convention can be called complete, brought his acquaintance with the company's policyholders up to the thousand mark at the Chicago meeting. Ferguson and Jackson harbor the ambition to get every independent company in business for their proposition.

BETTER BOOTHS

Churchill Cabinet Co., Chicago, Adds to Telephone Popularity

Chicago, Ill.—Pay station revenue is one of the most profitable branches of the telephone business. Without booths, pay-station patronage never is properly developed. It follows that the safer, more sanitary and convenient the booth, the greater the volume of trade which it attracts.

Before the war, the booth business flourished. With better booths, it will prosper again to an even greater degree.

O. Gullicksen, head of the Churchill Cabinet Co., Chicago, had this view of the situation before him for sometime. In fact, he foresaw it during the war and originated then the improved Churchill receding door booth which has since ben tested under trying conditions and in unfavorable locations by the hundred, in order to subject it to the severest tests. In over three years covered by these tests, the Churchill booth has achieved a clean record and has won hearty commendation from experts.

Safety is one of its outstanding features. Women subject to excitement, hysteria or fainting spells are safe in the Churchill booth, and in case they should be taken while there, it is impossible for them, in falling, to block the door and prevent an instant rescue. This booth's superior ventilation and ease in opening and closing please all classes of patrons. A slight pressure of the right hand against the right side of the door yields ready entrance and exit. The outward-turning door also conforms to the best modern practice—another safety-first idea. When not in use, the door always stands open and the booth gets fresh air between calls. The Churchill is economical in both its cost and in the space it occupies. Mr. Gullicksen, who personally invented and perfected this booth, has enjoyed intimate relations with the telephone industry and its requirements for over twenty years. He is among the country's oldest builders of telephone cabinets and the many styles he created in that commodity alone would fill an interesting museum, as he had scores of manufacturers with varying tastes and demands to satisfy. Out of this wealth of acquaintance and experience Mr. Gullicksen evolved the Churchill booth. It can be bought singly or in batteries. Architects will find it worth considering as a built-in feature for homes, factories, stores, offices and halls. The Churchill booth is shipped knockdown and carefully crated, weighing but 260 pounds. Its compact security in this form gives it decided preference for export as well as domestic trade. Having but few parts and being accompanied by printed and illustrated instructions, any novice can

O. GULLICKSEN

readily uncrate and erect a Churchill booth. It looks like another of those things that will still further popularize the telephone—and this doubtless accounts for its welcome among manufacturing and operating telephone companies.

Prest-O-Lite found that it had many users in the telephone industry. L. G. Hanodel, J. R. Sullivan and Tom Shepherd explained Prest-O-Lite torches, soldering irons and gas.

One of the spotlighted features of the exhibits was the new Automatic type 21 common battery telephones, which its makers state, is the first time in eight years that any line of common battery telephones has been completely redesigned. A conveniently arranged and extensive array of Strowger automatic central office equipment was constantly inspected by visitors, and judging from the interest evident, Automatic's prospects for 1923 business are exceedingly bright. A complete demonstration of Strowger automatic operation was one of the educational highlights of the meeting.

Improved business methods in the office were suggested by the exhibits of the Addressograph Co., the Acme Card System Co. and Index Visible.

Appraisal methods were shown in a very interesting educational exhibit by the American Appraisal Co.

A complete line of ringing and charging machines, test sets, equipose arms, special lightweight operator's receiver and radio receivers were shown by Holtzer Cabot. In attendance were Thos. Meinema, Wm. Reid and M. E. Gault.

The Templeton, Kenly & Co., exhibit consisted of their No. 329 Simplex Pole Pulling Jack for pulling or straightening telephone poles; the No. 22 Simplex Cable Reel Jack for handling cable reels and other types of jacks for use by the telephone industries. They featured the new No. 329 Simplex Pole Jack, superseding their old No. 328. The new No. 329 is similar in operation and general construction to the No. 328 but includes a number of improvements in its internal mechanism, calculated to give greater efficiency and longer wear.

CONVENTIONALITIES

Francis Dagger, telephone expert for the Ontario Railway and Municipal Board, again was among the luminaries present at the national convention and extended a hearty invitation to the telephone men of the United States to attend the coming Canadian telephone convention.

Among the convention visitors at Chicago last month was J. D. Park, manager of The Kenton (O.) Telephone Co., of which his father was one of the organizers. J. D.'s start in the telephone business dates back some 22 years and covers practically every detail from digging holes on up. His company which now has 2800 subscribers, includes 1000 farmer lines, all on the one automatic exchange.

Engineers!

The expansion of our telephone equipment engineering organization presents an excellent opportunity to electrical and telephone engineers who seek permanence and a good future in the profession, and to technical men who are capable of becoming engineers.

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Superposed Circuit Working

Phantom Telephone Circuits and Combined Telephone and Telegraph Circuits Worked at Audio Frequencies Are Described in British Electrical Society Address

By J. G. Hill

The methods most generally employed to provide extra channels of telegraph or telephone communication may be classified under the following heads: (1) the Impedance or Retardation method; (2) the Equipotential method. The impedance method was first introduced by F. Van Rysselberghe, a Belgian, in 1882. Combined working is rendered possible by the different action of inductance coils and condensers respectively, to high-and low-frequency currents. The action depends upon the fundamental difference of telegraph Morse signals and telephone speech currents. If a condenser of sufficient capacity is placed in series with a telephone receiver, the attenuation of speech currents is just perceptable but to low frequency currents the impedance is very high. On the other hand, an inductive impedance permits signalling on telegraph circuits at hand speed but reduces the rate of rise of telegraph current and reduces the tendency of these signals to cause disturbances in the telephone apparatus. It has a very high impedance to telephone speaking currents. The Van Rysselberghe system which depends fundamentally on the action described is shown in Fig. 1.

A mathematical analysis shows that the rate of rise of the telegraph voltage is logarithmic and may be advanced or retarded by arranging suitable values of the inductance, capacity and resistance. These values must be carefully chosen. In Morse-Wheatstone circuits it is possible under favorable conditions to obtain a speed of 600 words per minute but it is preferred to work at a speed of 200 words per minute. With the amount of retardation necessary to reduce the noise in the telephone sufficiently for satisfactory working, experiment shows that 60 words per minute on an overhead line duplex working can be obtained only under most favorable conditions. In order to provide a working margin of safety, the Van Rysselberghe system is in fact generally worked at hand speed.

Method of Telephone Ringing

The ordinary magneto generator, of low frequency is liable to interfere with the telegraph apparatus and as a rule some form of buzzer or interrupter is used to generate the calling current on all types of composited circuits. In one arrangement the generator is a vibrating bar, the natural frequency of which is 140 periods per second. The relay designed to receive the signals consists of a bar tuned to the same frequency. The receiving apparatus must be designed so that it will not respond to the telegraph signals.

Composited Circuits

Fig. 2 shows an arrangement for utilizing the two wires of a double wire circuit to form two duplex circuits. This arrangement is known as composite working. It is sometimes used to superpose telephone call wires

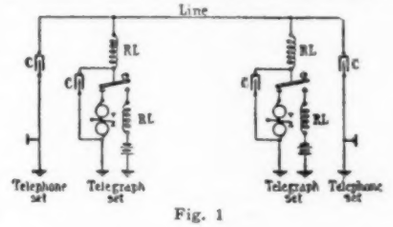


Fig. 1

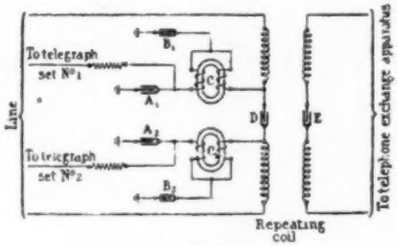


Fig. 2

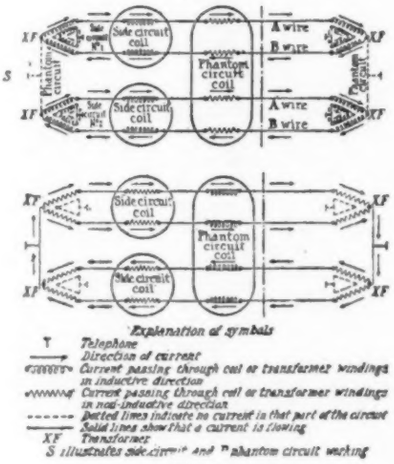

Side circuit coil
Phantom circuit coil
A wire
B wire
XF
S
Explanation of symbols
T Telephone
Direction of current
Current passing through coil or transformer windings in inductive direction
Current passing through coil or transformer windings in non-inductive direction
Dotted lines indicate no current in that part of the circuit
Solid lines show that a current is flowing
XF Transformer
S illustrates side-circuit and P phantom circuit working

Fig. 3

worked by telegraph upon junction circuits worked on the common battery system or alternatively, one wire is used as a telegraph call wire and the other for automatic signalling on the junction circuit.

Telephone Phantom Circuit Working

The well known equipotential method of superposing is of great importance and wide utility. Fig. 3 furnishes an example of the system. The relative transmission efficiency of side and phantom circuits on aerial lines depends essentially on the arrangement of the wires on the poles. The relative transmission efficiency of both side and phantom circuits is inversely proportional to the real part B of the Complex attenuation constant (B+jd) and may be found from the following well known formula:

$$B+jd=\sqrt{(R+jwl)(G+jwc)}$$

where B=real part of attenuation on constant

d=wave length constant

R=effective resistance per unit length

L=effective inductance per unit length

G=effective leakance per unit length

C=effective capacity per unit length. The transmission efficiency is also affected by the impedance of the circuit. The minimum attenuation constant in unloaded circuits is theoretically attained when we have

$$LG=CR$$

As a general rule the transmission efficiency of a circuit is improved by separating the wires more widely because the normal capacity is in excess of the inductance. There is, however, the accompanying disadvantage that the separation of the wires increases disturbances from outside sources.

If the four conductors of the phantom circuit combination are arranged on the pole arms so as to form a square as seen end on, the side circuits being the diagonals of the square, it can be shown that the transmission efficiency of the phantom circuit is a little less than that of the side circuit. If the four wires are ar-

ranged at equal horizontal distances on the same pole arm it can be shown that the phantom circuit has a lower attenuation than the side circuits and this is verified in practice.

Side and Phantom Circuits in Cable

The relative transmission efficiency of side and phantom circuits in unloaded air space cable of the multiple twin core type follows the general rule. On account of the closeness of the conductors the capacity is relatively much higher and the inductance relatively much smaller than in aerial wires. Experiment on recent cable shows that the capacity of the phantom is approximately 50% in excess of that of the side circuit.

In submarine cable on account of the screening of the conductors the capacity relations are simplified. A metallic loaded phantom circuit has approximately the same efficiency as the side circuit. The earthed phantom circuit, however, is materially less efficient.

It is possible under favorable conditions to combine the loaded phantom circuit with the composited arrangement. For this purpose the telegraph sets arranged as shown in Fig. 2 may be added to the two side circuits shown in Fig 3.

Transformers in Phantom Circuits

This apparatus absorbs a certain amount of energy and the effect on transmission requires consideration. The signalling frequency is approximately 17 period per second whereas the mean frequency of voice is taken as 800 period per second. A transformer which meets the requirements is available however, in which the transmission loss does not exceed one mile of standard cable.

Loaded Phantom Circuits

When the phantom circuit is loaded a separate and extra coil is required at every loading point. (See Fig. 3). In practice the relative efficiency of loaded side and phantom circuits is largely determined by the commercial as well as the electrical possibilities. The rule used in Great Britain is CDL=25 where C is the capacity in mf. per mile, D the distance in miles separating the coils and L the inductance of the coil in millihenrys.

Cross-talk Due to Want of Uniformity

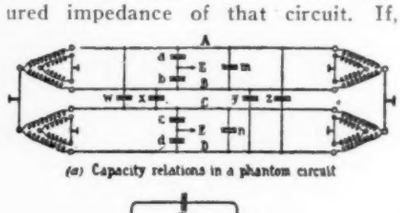
The loading of circuits augments the difficulty from overhearing between phantom and side circuits and cross talk between side circuits. In order to secure a perfect balance the resistance, capacity, inductance and leakance of the four wires must be equal. Resistance, inductance and leakance may be controlled in manufacture and laying but special methods must be used in laying to equalize the capacity of the wires in each four wire group. Owing to the introduction of telephone relays a degree of accuracy in capacity balance is required which was not considered necessary for loaded circuits without relays. Where four wire telephone relays are used the circuits are not usually phantomed.

In balancing the capacity in underground cable, each four wire group is balanced in short lengths. The complete unit for independent balancing is the loading coil section. The capacity system may be represented by 10 capacities and it can be shown that from six capacity measurements the necessary combinations to avoid overhearing and cross-talk can be deduced. (See Fig. 4). These measurements are made by a double bridge designed for use on the road. A process for capacity balancing by the addition of small condensers to the conductors has been patented.

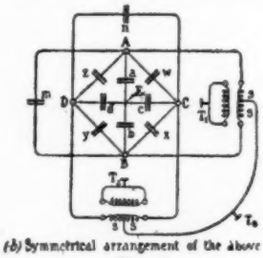
Effect of Non-uniformity on Relay Working

In telephone relay circuits where the relay current is applied to the line in bridge, if the lines are not of equal impedance the amplifier may give out a loud note. To overcome this the lines were divided and a separate relay was allotted to each, the line in each case being balanced by an artificial network. This involves constructing a network for a given circuit which approximates the measured impedance of that circuit. If, however, the circuit is series loaded the calculated impedance may differ appreciably from the measured impedance. Fig. 5 shows the calculated impedance curve of a loaded circuit in dotted lines and the result of the measured impedance over the same frequency range is given in solid lines. The difference is due to want of uniformity in circuit constants. Where these conditions are departed from, notably as regards uniformity of spacing and variation in inductance and capacity reflection takes place at the points of non-uniformity. Experiment shows that leakance and resistance do not cause appreciable difficulty but the inductance of each coil must not vary from the mean by more than 2% from the mean spacing distance. As regards capacity, a restriction of the amount of uniformity has not been fixed in Great Britain. Recent extensive experiments have been made in Germany and the general problem has also received careful attention in America.

The study of superposed circuits is of increasing importance and requires special study. It involves engineering questions of great complexity and the ultimate object is to find the combination which for a given number of years gives the required overall efficiency at the most economical cost.



(a) Capacity relations in a phantom circuit



(b) Symmetrical arrangement of the above

Fig. 4

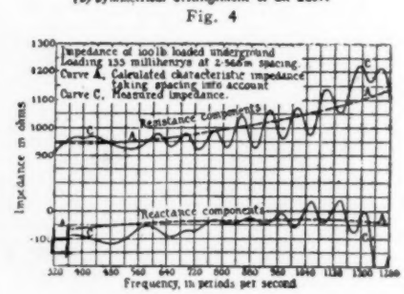

Impedance of 100lb loaded underground
Loading 135 millihenrys at 2-568m spacing
Curve A, Calculated characteristic impedance
taking spacing into account
Curve C, Measured impedance.
Resistance component
Reactance component
Impedance in ohms
Frequency, in periods per second

Fig. 5

Table I.

Capacity Formulae for Aerial Lines

$$C = \frac{1}{4\log(d/r)}$$

Phantom circuit:

$$C = \frac{1}{2\log(d/2r)}$$

Inductance Formulae:

$$L = 4\log(d/r) + u$$

$$L = 2\log(d/2r) + u/2$$

r is the radius of the wire, d is the distance between the wires of the side circuit and u is the permeability of the conductor, assumed to be constant. Wires arranged in a straight line on the same arm at equal distances, the wires composing the side circuit in each case being crossed with each other at regular intervals.

$$C = \frac{1}{4\log(d/r)}$$

$$\log(\sqrt{3}d/2r)$$

$$C = \frac{}{2\log(d/r)\log(3d/r)}$$

$$L = 4\log(d/r) + u$$

$$L = 2\log(3.46\,d/r) + u/2$$

See "Telephonic Transmission of Superimposed Circuits" by Kazukiyo Ogawa, Researches of the Electrotechnical Laboratory, Department of Communications, Tokyo, Japan, July, 1919.

OKLAHOMA ON THE JOB.

A Dozen Southwesterners Prove to Convention Their Association's Pep.

Chicago, Ill.—Oklahoma has a live gang of telephone men. No doubt of that. When one of their number tosses away his crutches and shouts, "Damn the rheumatism; let's go", you know that the band from the southwestern empire has the spirit which makes an industry great.

A dozen of the leading movers in Oklahoma telephone affairs made the trip to Chicago's convention, with that able veteran, E. J. Boase dragging one slippered foot as evidence that nothing short of death would keep him from going with the boys to exhibit Oklahoma's standing in telephone affairs.

In previous years H. W. Hubenthal, the talented engineer of the Oklahoma utility body had been about the only Oklahoma representative at the national conventions, but this year he was accompanied by Jack Walton, president of the state's telephone organization, M. A. Sanders of the Southwestern Bell, and other notables of the Oklahoma Independent, Bell and oil company telephone business.

Oklahoma's entry as an up-and-at-'em association dates from Jack Walton's ascension to leadership of the state's telephone group, according to "Hubey", as the commission expert is called by his tribe. Hubenthal pays tribute to Walton as an inspiring leader, and maintains that his praise is the real dyed-in-the-wool article, for "Hubey" himself tried to get the state's telephone to function aggressively as a body but had rough sledding.

Walton, a tall, serious young fellow, says that the group meetings have been responsible for the association's unity and liveliness. He stole a page from Mohamet, he asserts, and since the telephone men in the smaller towns wouldn't come to the association, the association went to them.

In getting interest aroused and in putting the operators' schools on the map, the Southwestern Bell, through Sanders, tendered its services. Hubenthal, who was active in the operating end of the business prior to his commission connection, threw his best efforts into the group meetings, too, making addresses at each of the conventions that were judged to be, in themselves, well worth the expense of attending the convention.

With ringleaders like Walton, who is a constructive power in his own community, Boase, who is said to be the most progressive Independent telephone man in Oklahoma, Hubenthal and Sanders, Oklahoma registered good and strong at Chicago and gave plenty of proof that its state association wasn't going to take anybody's dust in profit to its members.

SALT DEPOSIT MAKES TROUBLE

Nova Scotia Company Has Severe Recurrence of Unique Trouble

Brunswick, N. S.—Telephone men are interested in the report of an official of the Maritime Telephone & Telegraph Company, operating in Nova Scotia, which tells of a peculiar trouble condition. The report says:

"Not since 1913 have our toll circuits at Yarmouth been so affected by the salt deposit trouble as this season, when it was in evidence from January 22nd to February 2nd. In 1913 steps were taken to deal with this nuisance: a special insulator was at that time adopted and was put in place of those then in use. That made a great improvement, but, as may be judged by recent experience, the complete remedy has not yet been devised.

"It may be interesting to some of our practical telephone brothers to know that when this 'salt deposit' is on the lines we cannot signal our nearest toll office, which is only 33 miles away. The transmission is very poor on 50 miles. The trouble does not affect only our telephone circuits, but operates in a similar fashion on telegraph and electric lines. All local lines are affected in proportion to the length and degree of exposure of their routes.

"The disturbance decreases at a distance of 70 miles inland, and clears in a rain storm; the deposit remains when the insulation should be at its best, viz., in frosty weather. It is quite visible to the naked eye and is seen on buildings, window glass, etc.

"Opinions have, of course, been formed concerning the cause of this phenomenon, and this is the most generally accepted one: in a high wind from the south to west by north, a quantity of salt is lifted from the ocean in the form of invisible moisture sufficient to saturate the air thoroughly. When the wind dies down this salt moisture, which is heavier than the normal moisture, falls to earth. Salt water being a good conductor of electricity, all exposed insulation is broken down until rain falls, which will permanently clear the trouble. A dry, sunny day will temporarily clear it, but with night the trouble returns."—Telephone Talk.

Standards Committee Works on Telephone Problems

New York City—The quarterly report of the American Engineering Standards Committee indicates the growing interest in standarization on the part of American industry. At the present time 106 projects have official status before the committee. While these deal with general engineering topics, there are some of especial interest to the telephone industry. Some of these relate to buildings such as the safety codes for building exits, floor and wall openings, ladders and elevators and escalators, drafts of which are now under consideration. Those relating to electrical work are the National Electrical Safety Code which is under revision and the fundamental electrical standarization rules and specifications for tubular and wood poles, the proposed standards for which have been submitted for adoption. Of the completed projects that of particular interest may be mentioned the specifications for Electrolytic and Lake copper wire, bars, cakes, slabs, etc., the specifications for soft or annealed copper wire and the national electrical code which may be secured from the committee headquarters at 29 West 39th St., New York, and the present edition of the National Electrical Safety Code and the safety code for protection of heads and eyes of industrial workers which may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Bell Financing the Measure of American Progress

Washington, D. C.—A national authority on industrial financing says: "In 1895 the capitalization of the American Telephone and Telegraph Company was $76,000,000.

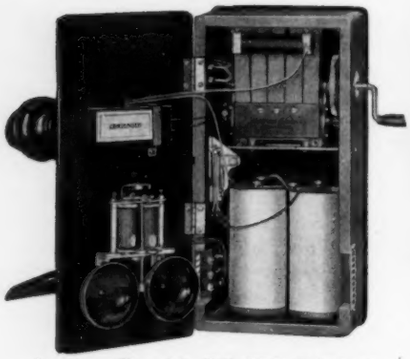
"Increases in capitalization have been as sure as the rotating of the calendar year, just as sure as American business expansion, and varying from a few millions increase to $250,000,000 annually.

"Stock increases do not affect the dividends of the company. Each new expenditure, each new increase in stock brings in its added business and enables the company to meet the dividends on the added capitalization without any trouble.

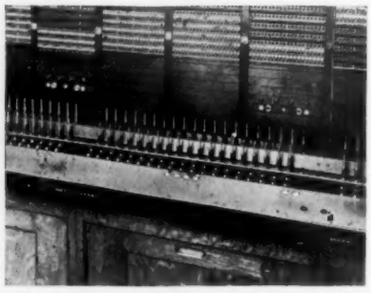
"Daily average telephone connections are about 35,000,000 a day.

"The new stock, $115,000,000, will require $10,350,000 a year dividends on the 9 per cent basis, and the earnings will more than warrant the declaration."

"Among Those Present" at the Exhibits

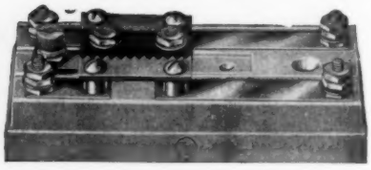


American Electric's X69 Wall Telephone



Stromberg-Carlson's Super-Service Board

Templeton-Kenly's Simplex Jack Pulling a Pole



Reliable Arresters Again in Evidence

Brockins' Blow Torch

Silvey Conduit Bender Shown by Paul Herbst

Leich's Attractive Head Set

STATE CHIEFS CONFER

Fifteen State Associations Represented at Chicago Luncheon

Chicago, Ill.—One of the important events of the Independent convention at Chicago was the noonday meeting of the president and secretaries of the various state telephone associations.

After problems that are common to all telephone companies were considered, it was agreed that a good stiff backbone was the prime factor in the solution of the difficulties.

There was no need to try to get along on a rate that manifestly was too low, the state executives decided, if the manager would assert himself and stand his ground, he'd win out.

Inductive interference also was discussed and reference was made to the South Dakota regulations which, in the opinion of Secretary Deering of the national association, afforded telephone companies adequate protection.

President F. B. MacKinnon of the National association presided at the meeting, with Charles C. Deering as secretary.

The states were represented as follows: Ohio—Frank L. Beam, F. L. McKinney and Frank A. Knapp; Illinois—E. D. Glandon, Jay Mitchell, A. R. Bone and H. H. Knipe; Oklahoma—Jack Walton; Texas—L. S. Gardner; Iowa—C. C. Deering and H. L. Beyer; California—C. A. Rolfe; Minnesota—Jay Greaves, G. W. Gretorex, J. C. Crowley, H. F. Lueders and D. M. Niell; Missouri—R. W. Hendrick and H. C. Todd; Indiana—Max Hosea, F. O. Cuppy and Sam Tolinson; Kansas—T. L. Youmans, L. M. Kraege, J. A. Gustafson and C. C. Raymond; Florida—W. G. Brorein; Pennsylvania—H. E. Bradley and E. D. Schade; New York—J. G. Ihmsen; Nebraska—R. E. Mattison; South Dakota—J. A. Steninger.

Simplex Wire & Cable Adds New York Branch

New York City—On November 1, 1922, the Simplex Wire & Cable Co., of Boston established a branch office in New York City at 120 West 32d St., with Mr. Joseph G. Brobeck as New York Manager. Mr. Brobeck has sold Simplex wires and cables in the New York territory since March 1920, previous to which he was connected with the Simplex sales organization at Boston for nineteen years.

Radio Joke Played on Club Diners

Hope, Ark.—A novel stunt was pulled off at the regular luncheon of the Hope (Arkansas) Rotary Club recently. A member who owns a radio set with a loop aerial put his set up in the club rooms and connected his magnavox with a telephone at a music store some blocks away. He announced that the Kansas City Star was going to put on a special program for the noonday luncheon of the club. He further stated that the loop aerial was a special new improved form and did away with all static disturbances. The proprietor of the music store did the announcing in the regular way and rendered a Victrola program. Everybody fell for it and the local paper carried a big write-up of it, complimenting the club, the Star and all concerned. It was several days before the truth was discovered.

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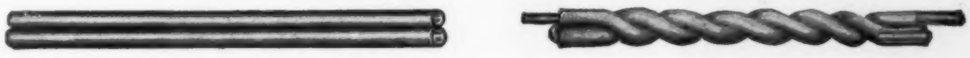

Line Wire Sleeve before twisting — Line Wire Sleeve after twisting

The strength and transmission efficiency of **your** lines are largely dependent on the strength of the splices. The best guarantee for satisfactory service you can have is RELIABLE SLEEVES.

RELIABLE SLEEVES are made and inspected to comply with the standard specifications of the largest telephone and telegraph companies.

Every sleeve that is shipped from our factory is guaranteed to pass inspection under these most exacting specifications.

RELIABLE COPPER SLEEVES have ample length and strength to assure splices as strong as the line itself, and moreover make a low resistance splice.

The "Rust Resisting Qualities" of RELIABLE TINNED STEEL SLEEVES far surpass any others, because of perfected methods of manufacture, which insure a "heavy" and "uniform" coating of tin.

A TEST WILL PROVE IT!

Reliable Electric Company

3145 Carroll Avenue CHICAGO, U. S. A.

WIRE TABLES (HH-2-15)

PROPERTIES OF MATERIALS USED FOR WIRES

EFFECTS OF IMPURITIES. The conductivity, ductility, tensile strength and malleability of copper are somewhat affected by the percentage of impurities contained in the copper. The impurities most common are those originally contained in the copper ore, and are as follows: Iron, Lead, Tin, Bismuth, Arsenic, Antimony, Silicon, Sulphur and Phosphorous. Copper has a very strong affinity for surphur and in working it, or when used in contact with sulphurous fumes it most be carefully guarded. In contact with air, copper is slowly dissolved by sulphuric acid. However, as the electrolytic copper from which nearly all electrical wire is produced is very nearly chemically pure, there is not much variation possible from standard specifications of purity. The following table is of more importance with copper bus bars, rounds and similar shapes than for wire since the rods are more likely to be produced by less perfect processes than the wire.

IMPURITIES IN DETAIL

IRON. This impurity does not much affect the mechanical properties, but about 0.03 of one percent decreases the electrical conductivity by 4 percent.

LEAD. An addition of 1/8 of one percent lead to copper makes the copper "Red Short," that is, makes it brittle when red hot, and about 3/4 of one percent ruins the copper entirely for ordinary purposes. Its effect upon the electrical conductivity is small, 0.35 percent only reducing the conductivity by about 1 percent.

TIN. This metal alloys with the copper and reduces its ductility when one percent is present. When 0.05 of one percent is present the conductivity is reduced by about 4 percent.

BISMUTH. About 0.02 of one percent makes copper red short, and 0.05 of one percent makes it cold short. The effect of bismuth upon the conductivity is small, 0.35 of one percent reducing the conductivity only by 0.25 of one percent.

ARSENIC. This slightly affects the ductility but when as much as 0.8 of one percent is present the copper can still be drawn into fine wire. Arsenic has a very marked effect upon the conductivity, 0.01 of one percent reducing the conductivity by about 4 percent, and 0.14 of one percent reduces the conductivity by about 35 percent.

ANTIMONY. 0.5 of one percent affects the mechanical properties in about the same way that arsenic does. In larger quantities it is more injurious than arsenic. When 0.035 of one percent is present in copper the conductivity is reduced by about 4 percent, or by a smaller amount than arsenic.

SILICON. Toughness and malleability are not noticeably affected until 0.30 of one percent of silicon is present. About 6 percent makes the copper brittle. The conductivity is much affected.

SULPHUR. The addition of 0.25 of one percent lowers the malleability, and 0.5 of one percent makes it cold short but not red short. The presence of 0.14 of one percent reduces the conductivity by about one percent.

PHOSPHOROUS. About 0.4 of one percent of phosphorous makes the copper red short. The effect of phosphorous on the conductivity is enormous, 0.01 of one percent reducing the conductivity by about 20 percent.

SILVER. Although silver has a greater conductivity than copper, the presence of silver greatly decreases the conductivity of the copper with which it is alloyed.

GOLD. Gold exerts a similar effect to that of silver.

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THE NEVER CREEP CANNOT CREEP IT PULLS AGAINST THE SOLID UNDISTURBED EARTH
ALL DISTURBED AND MOISTURE EFFECTED EARTH IS BACK OF THE NEVER CREEP

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Here's all there is to installing a Never-Creep Anchor—bore a hole with an ordinary earth auger, drive in the guy rod, hang on the anchor plate, attach the guy wire to the patented Thimbleye.

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CHANCE COMPANY

ANCHORS PROTECTORS BRACKETS
SOCKET WRENCHES BACK TRUSSES

CENTRALIA, MO.

WIRE TABLES (HH-2-30)

PROPERTIES OF MATERIALS USED FOR WIRES

ALUMINUM. Aluminum stands next to copper in importance as a conductor, and while not extensively used in telephony, it possesses many properties of importance. Its most important physical characteristics are its extreme lightness (Low Specific gravity), its great coefficient of expansion, and its resistance to corrosion. It has a comparatively high conductivity being the nearest commercial metal to copper in this respect. It can be cast, forged or drawn into wire, but owing to the extreme weakness of the pure metal the aluminum is generally alloyed with some other metal when used commercially. It becomes hard by drawing through dies but can be easily annealed.

As with copper its mechanical and electrical properties depend greatly upon the nature and magnitude of the impurities present. The elongation of hard drawn aluminum is about the same as that of hard drawn copper. The average ultimate tensile strength is about 24,000 pounds per square inch.

The conductivity is about 60 percent of that of pure electrical copper, hence for equal conductivity, the cross-sectional area of an aluminum wire must be 60 percent greater than that of the equivalent copper wire. On this basis of equal conductivities the weight of the aluminum wire need only be 50 percent of that of the copper wire while the ultimate strength over the total cross-section of the aluminum wire would be 64 percent of the strength of the copper wire. Since the weight of a unit cross-section and length of an aluminum wire is only 50 percent of that of the equivalent copper wire, it is evident that aluminum can compete on a cost basis with copper just as long as the price of the aluminum per pound does not exceed twice the cost of copper.

There are, however, many serious objections to the universal use of aluminum wire. Its greater bulk for equal conductivity calls for a greater cost of insulation when the wire is insulated. It is difficult to solder and this introduces complication in making connections or joints. Its coefficient of expansion is so great that the sag must be much greater in warm weather than with copper and this sometimes leads to difficulties on long spans of wire. Aluminum is very strongly electropositive, hence when brought into contact with any other metal, a galvanic couple is set up which leads to destructive currents which in most cases result in the destruction of the aluminum. In many experiments, the couple produced by the junction of aluminum wire with another metal, as with clamped connections, has caused local currents which have resulted in noisy lines. If clamps are used for the connection of aluminum wire they must also be of aluminum.

PROPERTIES OF ALUMINUM
(Commercially Pure Aluminum)

Specific Gravity	2.680
Weight, Pounds per Cubic Inch	0.097
Weight, Pounds per Cubic Foot	159.700
Electrical Resistance, Ohms per cubic cm., 0°C.	2.46x10.6
Electrical Conductivity, Ohms per cubic cm., 0°C.	4.05x10.5
Electrical Conductivity, Silver = 1.000	0.63
Melting Point, C°	625
Latent Heat of Fusion, kilo-calories	28.5
Thermal Conductivity, Gram-Calories, Cubic cm., per C°	0.36
Temperature Coefficient of Expansion, C° at 40°C.	2.31x10.5
Temperature Coefficient of Expansion, C° at 600°C.	3.15x10.5
Temperature Coefficient of Expansion, F°	1.30x10.5
Specific Heat, 20°C.	0.2135
Specific Heat, 100°C.	0.2211
Specific Heat, 200°C.	0.2306
Specific Heat, 300°C.	0.2401

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MANUFACTURERS OF

9 Duct

VITRIFIED, GLAZED, CLAY CONDUIT

We carry large stocks of round singles, square single, two, three, four, six and nine duct, in standard and short lengths, splits, mitres and bends.

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Decreasing cost of production has made possible a reduction in the price of our

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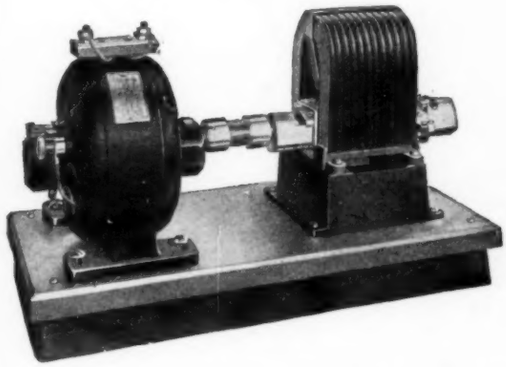

No exchange need "try to get along" with inferior ringing devices when our ringing sets are as reasonable as they are now. Tell us your exchange conditions and let us send you prices.

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THE telephone man's first requirement, of course, is that his batteries shall work with vigor while needed.

But he has to consider another point **—how long do they last?**

Inevitably, Columbia Gray Labels are always insisted upon by telephone men whose batteries show less cost per month of service. Fahnestock Spring Clip Binding Posts at no extra cost.

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Telephone Batteries
"less cost per month of service"

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SOUTHERN HOOSIERS MEET

Two Day Session of Southern Indiana Association Well Attended

Washington, Ind.—More than a hundred representatives of telephone companies in Southern Indiana attended the convention of the Southern Indiana Telephone Assn.

Addresses made to the convention included one—the history of the telephone industry's development, by A. E. Smith, General Commercial Superintendent of the Indiana Bell, "Simplified Accounting for C and D Companies," by Harry Boggs, the Indiana Commission's Chief Accountant, and "Connecting Company Relations," by D. H. Whitham, General Contract Agent for the Indiana Bell.

Max Hosea, of the Indiana Telephone Assn., Carl Wilde, Director of Service for the Indiana Public Service Commission, and Art Nehf, the N. Y. Giant's pitcher, also were on the program.

Evansville was selected as the place for the next convention, which is to be held Feb. 20 and 21.

Missouri Planning Big Meeting November 15 and 16

Jefferson City, Mo. The special committee appointed by the Executive Committee of the Missouri Telephone Association for the purpose of making arrangements for its annual convention, has decided on Wednesday and Thursday, November 15th and 16th as the dates. Its convention will be held at the Madison Hotel, Jefferson City. The sessions will be held in the Peacock Room, and there will be ample space provided for the exhibits of manufacturers and dealers. It has been two years since the Missouri Association has had a convention, and from the letters being received from the different parts of the State, the association anticipates the biggest and best meeting it has ever had.

Pennsylvania Convention Jan. 11-13, at Harrisburg

Harrisburg, Pa.—January 11, 12 and 13 have been selected as the dates for the annual meeting of the Pennsylvania Telephone and Traffic Assn. Hotel Penn-Harris has been picked as convention headquarters.

Illinois Utilities Spent Sixty Million Improving

Chicago, Ill.—In 1921 the public utility companies of Illinois raised and spent $60,000,000 on permanent improvements.

Trim Now—

before those sleet-laden dead branches fall onto the wires.
The handy rope-pull type

BARTLETT
SPECIAL No. 1
TREE TRIMMER

is designed especially for such work and does it easily, quickly and safely.

It is insulated; operated by a rope-pull and a 14-inch pull lever which increases the cutting power. Two additional four-foot sections can be added to main section so as to make over all length 16 feet.
Every tool is guaranteed.
Bartlett Tree Trimmers are standard with leading telephone and telegraph companies.
Write for prices and literature.

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PEERLESS Automatic Water Stills
Absolutely pure water for less than one or two cents a gallon, no matter how polluted your supply of water may be. For drinking, chemical or battery purposes the Peerless stills give you the best, ample supply at lowest cost.
Operated without attention other than occasional cleaning.
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We manufacture all sizes of Douglas Fir Cross Arms. Write us for prices.
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FOR SALE—150 drop Stromberg-Carlson switchboard. All drops installed. Good condition. Ozark Township Telephone Co., Colony, Kan.

THRIFT UP-STATE THEME

Group Meeting Makes Big Feature of Economy in Operation

Syracuse, N. Y.—Employees of the Wayne Telephone Co. of Newark, according to the President and General Manager of that company, employ their rainy days annealing odd stocks of No. 12 N.B.S. copper wire, and cutting it into proper lengths for tie wires; making ground rods by soldering copper wire to rods, and splicing and soldering No. 17 twisted pair.

This was one of the incidents related at the Up-State Telephone Assn. of New York district meeting here. Saving of time by standardized operating methods was the keynote of the address of W. S. Vivian, who conducted a successful operators' school.

Other papers were read by E. R. Stonaker on "Measuring the Traffic Job," by Gordon Harris on "The Country and the Demands for Progress," on "Harmony" by T. P. Sylvan, Vice President of the New York Telephone Co. and on "Commercial Service Bureau Work and Its Direct Application" by L. W. Williams. John P. Boylan addressed the convention on the subject of public relations.

Connecting company relations were discussed by W. C. Sexsmith. Mrs. E. R. Lewis spoke on "Service Company Management." There were several valuable pointers on collections presented to the convention from the experience of members present. Other speakers who were featured included Public Service Commissioner Rogers, C. C. Green, and F. A. Burger.

Ohio-Michigan Operators Have Conference at Wauseon, Ohio

Wauseon, Ohio.—A two-day operators' conference was held here October 11 and 12 by operators of the companies comprising the Northwestern Ohio and Southern Michigan Telephone Assn. W. S. Vivian conducted the conference. Announcement was made by F. J. Spencer, President of the Association, that his operators had just received a $100 reward for their efforts in effecting capture of bandits.

Gonzales, Tex., to Blossom in New Exchange

Gonzales, Tex.—Ground has been broken for the handsome new exchange of the Gonzales Telephone Co. With an even break in luck the new building will be occupied this year.

Present plans of the DeKalb County Telephone Co. call for a $30,000 program in laying cable in cement, in Sycamore, Ill.